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**Teacher's Manual**

**THE NEW  
EDUCATIONAL COURSE  
IN  
CONSTRUCTIVE DESIGN**

BY

**EDITH PHELPS**

**DIRECTOR OF ART, SOUTH BEND, INDIANA**

AND

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**TEACHER HIGH SCHOOL ART, SOUTH BEND, INDIANA**

**SCOTT, FORESMAN AND COMPANY**  
**NEW YORK** **CHICAGO**

# PRINCIPLES and PRACTICE of ELEMENTARY DRAWING

By

MABEL BROWNING SOPER

Director of Art, State Normal School  
Bridgewater, Massachusetts

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A NORMAL SCHOOL TEXTBOOK, embodying the fundamental principles of the teaching of Art in the Elementary Public Schools.

The subjects treated are:

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- II. REPRESENTATION—1. Nature (Plant) Drawing. 2. Animal and "Pose" Drawing. 3. Object Drawing, including composition and perspective.
- III. MECHANICAL DRAWING—including diagrams, and "working drawings."
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The Illustrations—42 in all—include work of Normal Students and professional artists, as well as reproductions of the great masterpieces.

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## PREFACE

In this course of art instruction the aim of the authors has been to develop naturalistic drawing into design, and to apply it to construction work, in the belief that the realistic is valuable in so far as it is developed and applied in this larger way. The study of design is the foundation for the cultivation of artistic, creative, and critical ability and through this cultivation, judgment will be strengthened and appreciation developed.

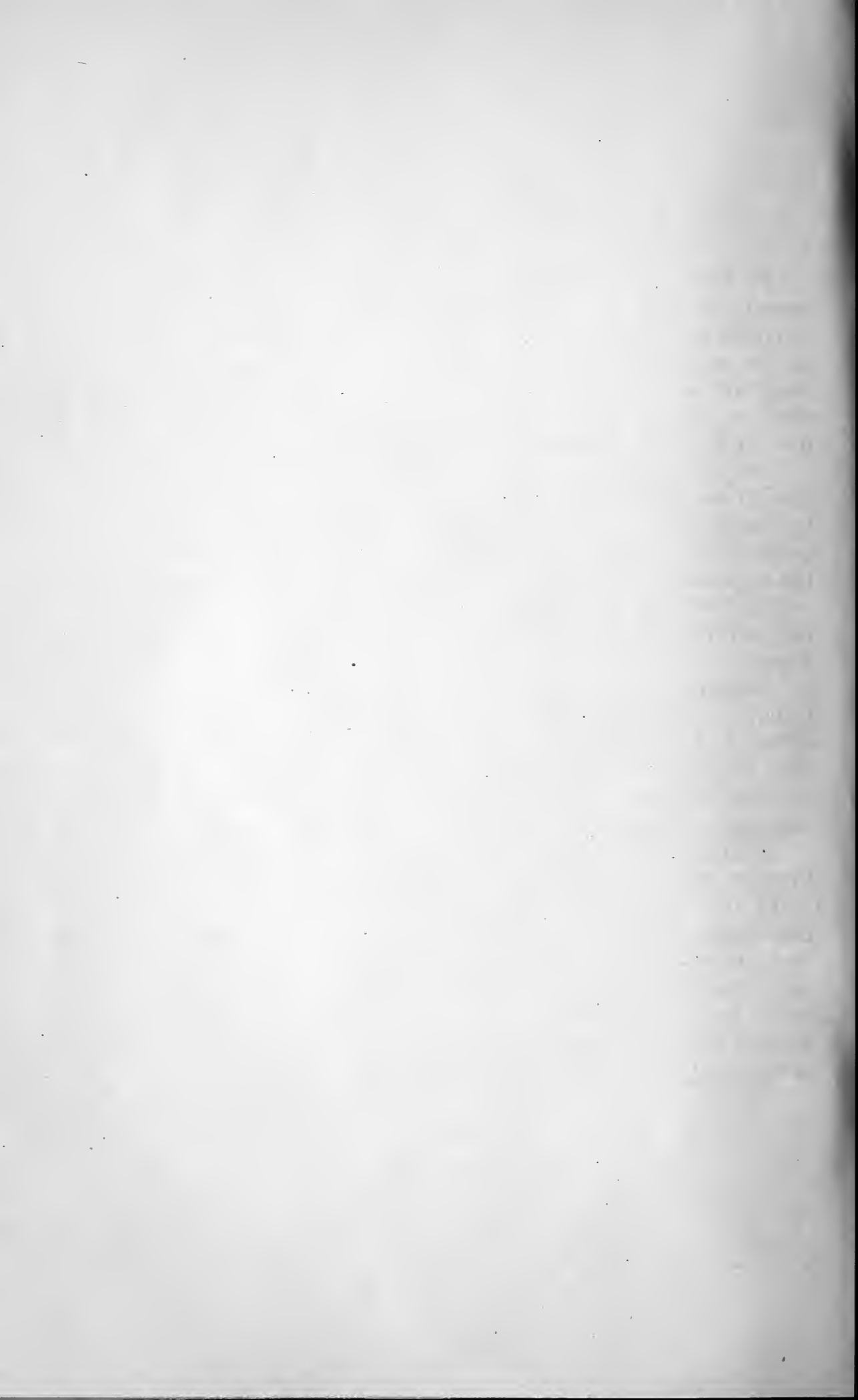
Only through demand comes supply, and when public appreciation and good taste are developed the productive activity will be vastly improved. A training in the principles of design and good workmanship—accomplished through construction work and the application of design—will produce not only intelligent buyers but skilled and artistic workers in the industries. These results can never come from rendering drawings from nature or models alone.

Constructive design has a disciplinary, practical, and educational value, making an actual connection between the work of the school and its application in the home and the world of industry. The average individual is so trained in the larger principles of art that he is able understandingly to apply them, and by so doing increase the efficiency of his social and industrial life.

To minimize the expense of equipment for this work in the average school the authors have endeavored to simplify materials and tools required, suggesting as much material as possible from the home. Pupils thus furnishing some of their own equipment feel an added sense of responsibility and appreciation. It is rightly said that "the interest of the child is the greatest factor in the process of education," and the interest can only be instilled when a student knows that his work is for a real purpose, that it is to be put to the test of application in his everyday life.

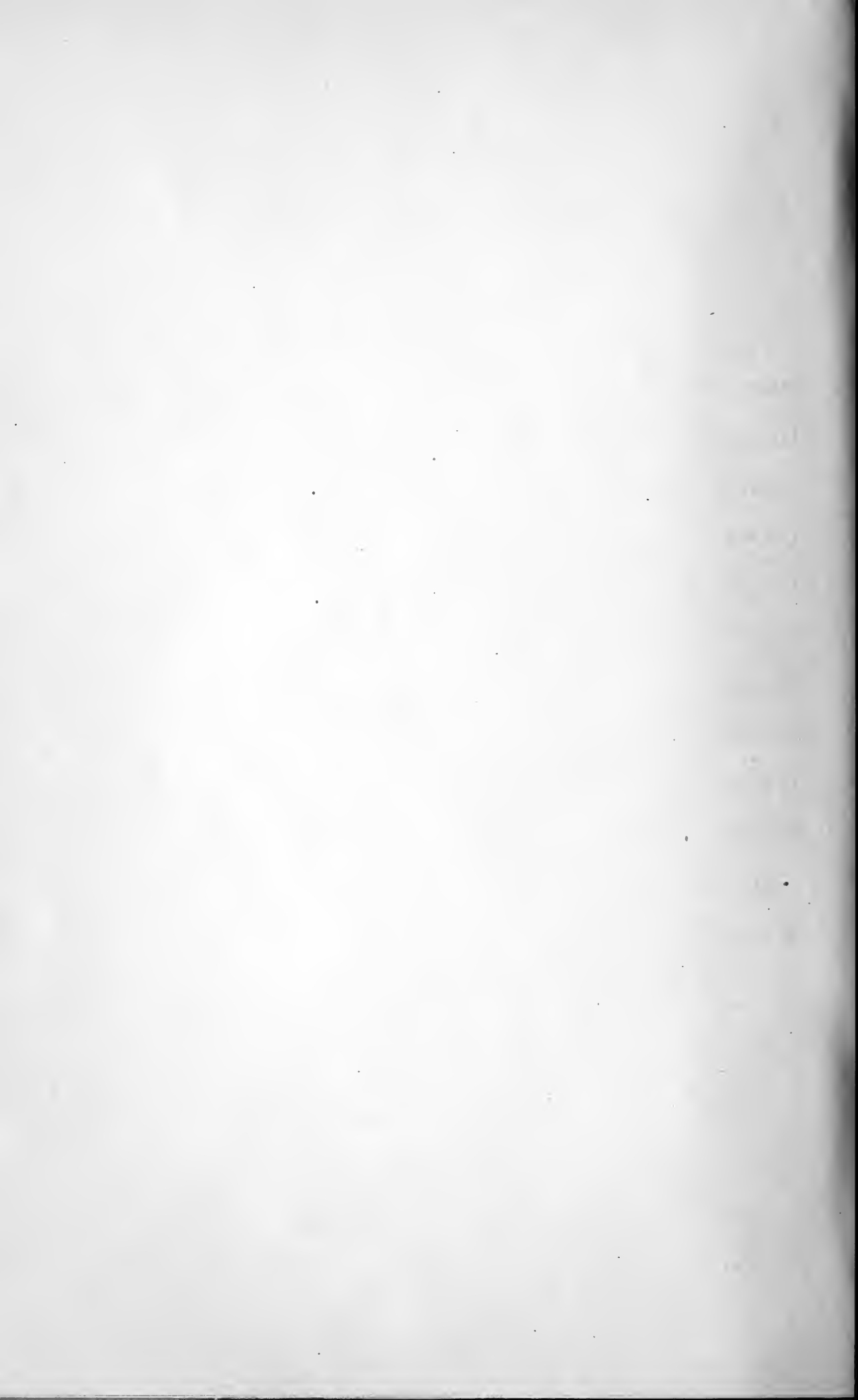
EDITH PHELPS.

MABEL ARBUCKLE.



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## LIST OF MATERIALS AND FIRM ADDRESSES

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W. O. Hickok Mfg. Co., Harrisburg, Pa.

### METAL AND METAL EQUIPMENT

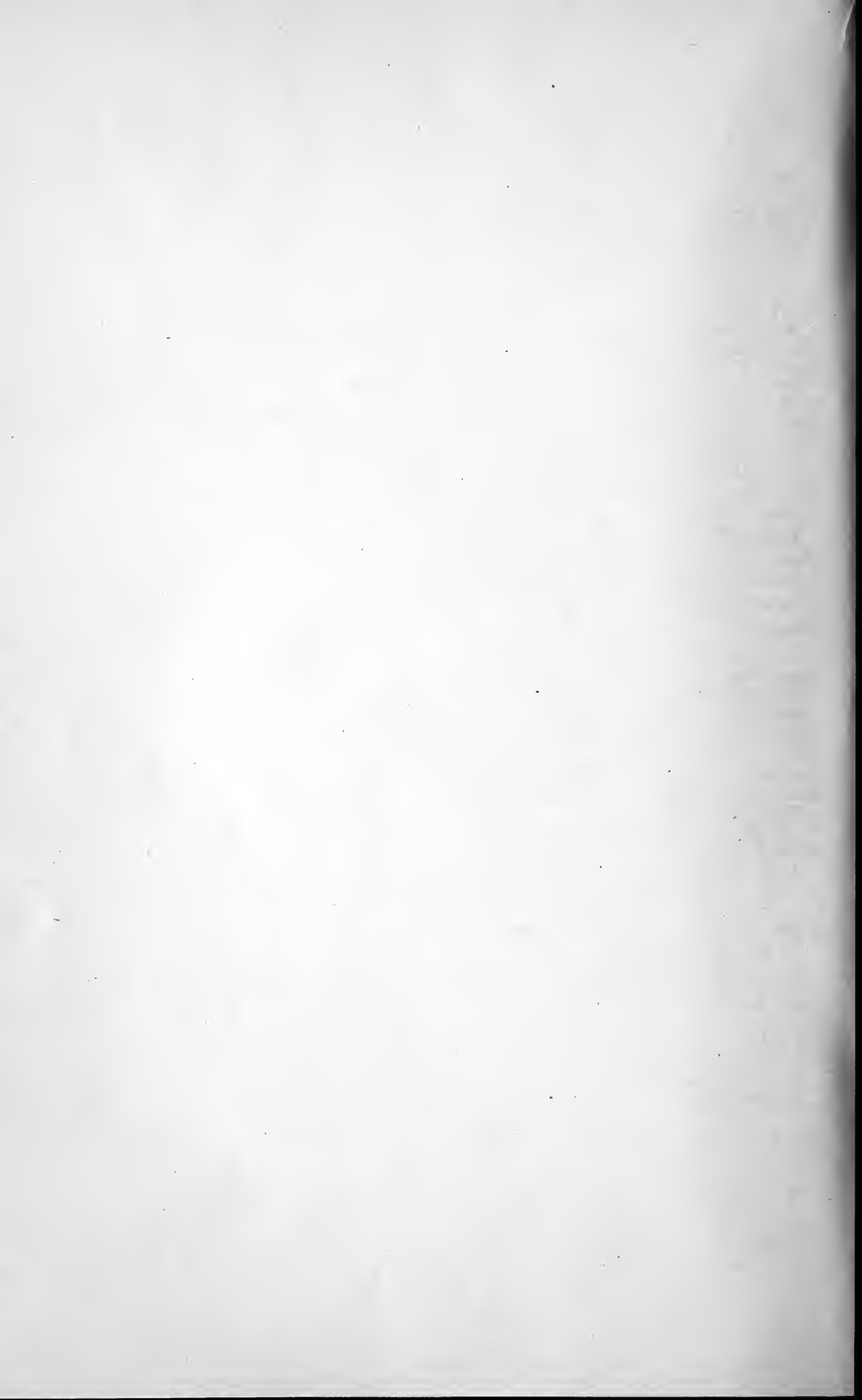
William Dixon, 39 John St., New York.  
The Thos. K. Lewis Co., 1534 N. High St., Columbus, Ohio.  
Orr & Lockett Hardware Co., 14 W. Randolph St., Chicago.

### REED

American Reed & Rattan Co., cor. Norman and Kingsland Aves., Brooklyn, N. Y.

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The Thomas Charles Co., Chicago.



## GENERAL DIRECTIONS

### COMPOSITION

**MARGINAL SPACING.** The proportionate width of margins in relation to each other should be as follows: Vertical Rectangle, bottom margin widest, side margin narrowest, top margin medium; Horizontal Rectangle, bottom margin widest, side margin medium, top margin narrowest. The proportion of width of margins should be approximately as 5 is to 7; as 7 is to 11.

In placing material upon a page, whether drawing, design, or writing, remember that the optical center is above the real center of the page. For this reason all bottom margins are widest; otherwise the material would seem to be slipping off the page. In a drawing, the center of interest should be near this optical center.

**COLOR THEORY.** This Course in Constructive Design, for its successful completion, involves a knowledge of color, the study of which should begin in the first grade. This study of color should correlate with the course through the grades and high school. As a working basis, the following outline, which can be elaborated upon according to the judgment of the teacher, is suggested:

Grade One, Primary Colors.

Grade Two, Primary and Bimary Colors.

Grade Three, Values, Normals, and Tints.

Grade Four, Normals, Tints, and Shades.

Grade Five, Hues—Complementary Harmonies.

Grade Six, Monochromatic Harmonies—Analogous Harmonies.

Grade Seven, One-half Neutralized Harmonies.

Grade Eight, Three-quarters Neutralized Harmonies.

High School, Triad Harmonies; Split Complementary Harmonies. Values in steps from white to black. Review complementary, analogous, and monochromatic harmonies.

**APPLICATION OF DESIGN.** Crayons are excellent to use in the lower grades, as they are clean and can be handled easily by.

younger students, especially in the adaptation of small motifs. Water colors may be used on light toned papers.

In using water colors, apply to small motifs only, as it is almost impossible for the average student to place an even wash on a large surface with water color.

If the design is large, water color may be mixed with temperine. This combination makes an opaque color, which produces a smooth even wash.

Fresco colors are excellent to use for design, and they are very inexpensive. They may be purchased in powder form and mixed with water in quantities desired. Tempera colors are most desirable for decorative use. The color is luminous and the texture exquisite. They can be used on any value of paper.

#### RULES FOR CONSTRUCTION

**PASTING.** With a flat brush one inch wide, spread paste quickly and evenly over the entire surface to be adhered. Use only enough paste for holding purposes.

The Fishart dry paste is excellent and can be used by mixing in quantities desired with cold water. The Sphinx paste is inexpensive, good, and will keep indefinitely. It has the added advantage of being already mixed. Sphinx paste is excellent to use in leather problems, as it will not stain the leather.

In attaching paper to cardboards, spread paste on paper. In attaching book cloth to cardboard, spread paste on cardboard to prevent the soaking and stretching of the book cloth. In attaching linen or cloth covers to cardboard, spread paste on cardboard quickly, as cardboard absorbs the moisture rapidly. After attaching paper or cloth, turn to right side and with palm of hand, iron out all wrinkles, air bubbles, or other imperfections.

In pasting, use a generous supply of clean scrap paper upon which to paste, changing to a clean and dry paper each time a problem is turned. This is the only way to insure neatness in pasting, and if this process is not carefully adhered to the problem will be ruined, for it is impossible to remove paste without leaving a mark. Unprinted newspaper or wrapping paper is the cheapest and best scrap paper to use. If it is not possible to have either of these, use printed newspapers, being very careful, however, that the ink does not rub off on the problem.

**CORNER TURNING.** There are two methods of corner turning:

*Corner 1.* Fold corner of cover paper at right angles to edge over to back of cardboard. Spread this right angle triangle with

paste and turn margins attached to back of cardboard. See illustration Plate Six, Grade Three.

*Corner 2.* Cut corner of cover paper off diagonally  $\frac{1}{8}$ " from corner of cardboard. Fold over top margin. Turn in small extra V-shaped piece to side margin. Fold side margin to back of cover board.

**EDGE PLANE.** In pasting to edges of cardboards, remember that the edge is a flat surface, a plane to which the cover is to be pasted as carefully as to a large surface.

With bone folder, turn over cover against edge, keeping a sharp line at turn. Paste to edge plane. Turn again on sharp line to other side.

Wherever there is an edge plane to be covered be most careful to show definitely that it is a plane. This insures a workmanlike finish.

**SCORING.** With round edge of scissors, score lines on paper before folding. With sharp point of knife score cardboard half way through and bend only to a right angle, with scored line on outside of bend.

**PRESSING.** Use boards between all problems in pressing, as problems are of different sizes, and will become bent or marred unless protected in this manner. To insure good results, all parts must be pressed until dry.

#### *EQUIPMENT NECESSARY FOR ELEMENTARY BOOK BINDING*

##### INDIVIDUAL EQUIPMENT.

1. Steel ruler (measuring to  $1/32$ ").
2. German paring knife.
3. Bone folder.
4. Scissors.
5. Paste brush.
6. Large sheet of cardboard to place on desk or table for protection.
7. Paste and glue.
8. Clean scrap paper (upon which to paste).
9. Needles, thread, and tape.
10. Hammer.

##### GENERAL EQUIPMENT.

1. Press.
2. Pressing boards.
3. Sewing frames.

*THE BOOK*

When a book comes out of press it has a certain number of pages in a section. A section is a certain number of folded sheets placed one within the other. Four double sheets make a section in an octavo book. This is the form now generally used. The size is about 5"x7 $\frac{1}{2}$ ".

Illustrations are pasted in the section separately; two double sheets and two stubs, or four double sheets. Each section is numbered. The number appears on the first page of each section and is called a signature.

When ruling paper for cutting never use a pencil. Take measurements with point of knife, place steel ruler and cut from farther edge toward one. Hold ruler firmly down with left hand and cut a steady true edge.

Fold down center of sheet, creasing with bone folder. Place sheets one within the other until section is complete, then hammer well. When all sections are hammered, place one on top of the other.

The top of the book is called the head; the bottom, the tail; the front, the fore edge; the back, the back and the sides, the covers.

Knock up the head and back of book against table, letting any irregularity go to the fore edge and tail. Place in press.

# Constructive Design

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## GRADE ONE

---

### PLATE ONE

#### *FLOWER POSTERS*

FIG. 1. DAFFODIL. Cut out pattern of circle as in diagram. Place on yellow paper. Trace around and cut out. Fold so as to cut daffodil with six petals. Cut piece of yellow crepe paper  $1'' \times 2\frac{1}{2}''$ . Overlap short edges and paste together for the cup. Paste cup in the center of petals. Pull out the top of the crepe paper cup to form a wrinkled edge. Cut stems and leaf of green paper and paste to flower. Mount daffodil on  $6'' \times 9''$  bogus paper.

FIG. 2. SUNFLOWER with yellow petals and brown center. Make border of sunflowers for the schoolroom decoration. Have for the background a fence made of long brown strips of paper.

FIG. 3. JONQUIL with white petals and yellow center, edged with orange.

In the fall and spring the room may be decorated with borders of appropriate flowers: Sunflower for September, golden-rod and thistle for October, etc.

### PLATE TWO

#### *VEGETABLE AND FRUIT FIGURES*

FREE HAND CUTTINGS FROM VEGETABLES AND FRUITS. Children should have before them a large number of vegetables and fruits for study in free hand cutting. After sufficient skill has been gained in this work, combine the free hand cuttings of fruits and vegetables in such a way as to make a figure. Use toned papers, or color the manila paper with crayons. Draw the hair and features with crayons.

FIG. 1. Use free hand cutting of an onion for the head, a cucumber for the body, string beans for the arms, and lima beans

for the legs. Thread needle with string used double. Put knot at end, insert needle through the parts to be attached, and finish with a knot, as in illustration. (Staples could be used instead of the string to fasten the arms and legs to the body.) Attach string in the back, so that some action is shown by pulling it. (See sketch.)

FIG. 2 is made of the freehand cuttings of an apple, an ear of corn, apple leaves, and string beans.

Let children make original figures. The pumpkin and squash adapt themselves nicely to this kind of work.

### PLATE THREE

#### *RHYTHM DESIGNS*

FIG. 1. PAPER PARASOL. Cut out two bogus paper circles, one 3" and the other 2", and one bogus paper oblong  $1\frac{1}{2}'' \times 7''$ . Make a rhythmic border with colored crayons on edge of large circle. Cut on radius of each circle; overlap one inch, and paste. Place paste on edge of small circle, and attach to large circle as in Fig. 1. Roll handle from the oblong, making the top a trifle smaller than the bottom, and paste. Slip handle through the center of the two circles.

FIG. 2. CLOTH PARASOL. Cut a 6" white muslin circle, a 5" white muslin circle, and a  $4\frac{1}{2}''$  cardboard circle. Use a No. 4 reed or a skewer as the handle, and a brass-headed tack as fastener. Fringe edge of 6" circle. Add rhythmic border with crayons. Paste cardboard lining on back of 6" circle. Cover cardboard with 5" muslin circle. Tack handle to center of circle.

FIG. 3. SUNBONNET. Cut out 5" white muslin circle,  $4\frac{1}{2}''$  bogus paper semicircle, and  $4\frac{1}{2}''$  white muslin semicircle. Decorate the edge of one-half of the muslin circle with a border. Paste bogus paper lining on back of decorated semicircle. Cover bogus paper with the  $4\frac{1}{2}''$  muslin semicircle. Gather loose half of the 5" muslin circle with needle and thread to form back. Sew on the strings.

### PLATE FOUR

#### *FURNITURE*

FIG. 1. CHAIR. Use  $6'' \times 6''$  paper. Fold into sixteen squares. Dictation: Fold lower edge to upper edge. Unfold. Fold lower edge to middle crease. Unfold. Fold upper edge to middle crease. Unfold. Turn paper with the creases running

up and down. Fold lower edge to upper edge. Unfold. Fold lower edge to middle crease. Unfold. Fold upper edge to middle crease. Unfold. Cut off two strips to leave a square  $4\frac{1}{2}'' \times 4\frac{1}{2}''$ . Cut on the heavy lines of this square as indicated in Fig. 1. Fold into chair form and paste. Always paste the corner squares first, covering one entire square with paste. Cut openings on the back and sides as in small black figure.

FIG. 2. TABLE.  $9'' \times 9''$  paper. Fold into sixteen squares. Cut one strip of four squares off, making an oblong. Cut on heavy lines of oblong as indicated in Fig. 2. Paste corner squares together leaving middle square extended. Cut off a part of each end as the extension is too long. Cut openings on each end and the sides. From the strip of four squares cut off, make a shelf for lower part of table and paste to each end.

FIG. 3. DESK.  $9'' \times 9''$  paper. Fold into sixteen squares. Cut out four squares and fold into sixteen small squares. (The crosses indicate the unused squares.) Cut along the heavy lines of the sixteen small squares and fold on the dotted lines to make the legs. Then fold on the two side creases to form sides of the desk. Notice that the legs are made double so that the desk will stand securely. From the remainder of the paper, cut on the heavy lines and fold on the dotted lines to form front of desk. Paste as indicated.

FIG. 4. CLOCK.  $6\frac{1}{2}'' \times 8''$  paper. The face and pendulum are made separately and pasted on. For children without kindergarten training, it is better to hectograph pattern of clock.

FIG. 5. CRADLE.  $6'' \times 9''$  paper. Hold paper with short edge in front. Fold lower edge to upper edge. Cut on crease. Fold lower edge to upper edge of one piece, making an oblong  $2\frac{1}{4}'' \times 6''$ . Cut two slits on fold as indicated in drawing. Cut 2 squares  $3'' \times 3''$  from remainder of paper for ends of cradle. Cut two slits and curve the corners. Intersect ends in cradle. Do not paste.

Cover  $9'' \times 12''$  cardboard with a tone of paper appropriate for the wall. Arrange and attach furniture, making a side elevation of room. Make side elevations of kitchen, bedroom, play-room, etc.

## PLATE FIVE

## CHRISTMAS GIFTS

FIGS. 1, 2, 3. NEEDLE BOOK.  $9'' \times 9''$  paper. Fold lower edge to upper edge. Unfold. Turn paper with crease in a vertical position. Fold upper edge to lower edge, making only a dent on each edge to mark the center, as a crease across the entire paper mars the beauty of the project. Fold lower edge to center; fold upper edge to center.

Fold lining paper  $4\frac{1}{4}'' \times 6''$  on short center axis. Place center crease of lining paper on center crease of cover and fold extended sides over lining paper (Fig. 1).

Cut two pieces of white flannel  $4\frac{1}{2}'' \times 6''$ . Pin on center crease of lining paper (Fig. 2). Place lining paper in side pockets (Fig. 3). Decorate cover by simple cut paper designs.

The case could be fastened by a tape, if two slits were made in the front cover and two in the back cover for it to slip through.

FIG. 6. BOX FOR CANDY OR NUTS. Fold  $9'' \times 9''$  paper into sixteen squares as in Fig. 4. Cut on the heavy lines, leaving a square for the base and one on each side. Fold side squares in half. Cut slits near the center (Fig. 5). Run a long band ( $\frac{1}{2}'' \times 9\frac{1}{2}''$ ) through openings, and paste ends of band together as in Fig. 6. This band may be decorated with colored crayons by a rhythmic border.

FIG. 7. CANDY CANES. Paste strips of white paper on red paper in such a way as to form a rhythmic design.

## PLATE SIX

## VALENTINES

VALENTINE I. Fold  $8'' \times 8''$  paper into sixteen squares. Cut out corner squares. Paste one heart in the center. Turn paper over and paste one heart in center of each side flap. Take  $4'' \times 4''$  white paper and cut on heavy lines. Then fold on dotted lines, as in Fig. 1. Paste in center of  $8'' \times 8''$  paper with opening over the red heart. Fold as in completed diagram.

VALENTINE II.  $4\frac{1}{2}'' \times 6''$  white paper. Fold on dotted line. Cut and paste red paper design.

VALENTINE III.  $6'' \times 9''$  red paper. Fold in form of book. Fold in same way sheet of manila paper  $6'' \times 9''$  and place inside. Tie with red raffia and seal by a strip of manila paper and heart sticker.

**CLOTHES PIN FIGURES.** Indian costume made of brown wrapping paper. Cut two pieces,  $2\frac{1}{4}'' \times 2\frac{1}{4}''$ , for the trousers. Color edges with red crayon. Wrap around prongs of clothes pin. Paste edges together, and cut fringe.

Cut coat  $2\frac{1}{2}'' \times 5''$ . Fold short edges together. Cut out V-shape at the neck and a strip from each side. (See drawing.) Color edges red. Slip coat over the head of clothes pin. Paste the sides and cut fringe. Use black yarn for hair. Figure will stand if glued to a piece of cardboard.

The man in evening dress is made by painting a clothes pin black. Cut out arms of paper and fasten by a small tack. Cut white paper shirt front and paste in place.

Follow the diagrams and make other costumes.

Correlate costume designing with the language and history work.

## PLATE SEVEN

### AUTOMOBILES

**FIG. 4. TWO PASSENGER AUTOMOBILE.** Fold  $9'' \times 9''$  paper into sixteen squares. Cut off one strip of four squares. Turn paper with three squares in front. Cut right edge of lower left square and left edge of lower right square. Do the same on the upper row. Paste corner squares together, leaving center squares extended. Make the front and sides curved as in Fig. 1. From the strip of four squares, cut off two and one-half squares. Paste one end to the extended square at the front, and the other end inside the body of the machine. (See chart.) Cut two slits in sides (Fig. 1).

Give each pupil a piece of paper,  $2\frac{3}{4}'' \times 3\frac{1}{2}''$ , as a pattern to cut around. (See Fig. 2.) Cut and fold as directed. X indicates ends of strip to be cut off. Intersect the slits of seat in right-angled cuts on sides. Cut around pattern for wheels. Paste two circles together for each wheel, to add strength. Fasten by a paper clip or collar button. Fold a strip,  $2\frac{1}{4}'' \times 4''$ , into four parts and paste on the back for a trunk box. Make steering wheel of small circle. Insert a long strip of paper through a slit in circle and paste strips together. Paste circle of same size on top, making the steering wheel double. Place steering wheel in proper position with reference to bottom of machine and the seat, and attach to automobile.

**FIG. 5.** Same as Fig. 4, except that auto top is added. (See Fig. 3.)

Vary designs for top of machine.

FIG. 6. Five passenger machine constructed the same as Fig. 5, except that it is made of  $9'' \times 12''$  paper, folding into sixteen oblongs instead of sixteen squares.

On the sand table, build a well-known street.

Show other means of transportation such as wagons, engines, sleds, and boats.

## PLATE EIGHT

### *STICK PRINTING.*

**LINEN APRON.** Practice making borders on  $\frac{1}{4}''$  checked paper, with the stick printing. Use dyes. After a satisfactory design has been made and familiarity with the medium gained, stamp border on a child's apron made of  $\frac{3}{4}''$  checked linen. If the material has a blue line, stamp design in blue. The measurements given on the illustrations are for a child two years old. Enlarge pattern to fit the wearer.

Make kitchen holders of the barred linen. Stamp borders on towels and table mats. Use motifs suggested, also make original units. This work could be continued through the grades and into the High School.

## PLATE NINE

### *ANIMAL CUTTINGS*

**ANIMALS MADE FROM CORNERS OF ENVELOPES.** Cut out patterns, place on envelopes, and trace. The cross indicates the corner of the envelope. Fold on dotted lines. Eyes and ears may be put in with pencil.

FIG. 1. A FLYING BIRD.

FIG. 2. AN ELEPHANT. The trunk may be curved by drawing the paper over the edge of the closed scissors.

FIG. 3. A SQUIRREL. Bend the tail in the center, so the squirrel will stand.

FIG. 4. A DUCK. Turn the corner inside, so that the duck will stand. Fill with nuts to be served with the duck dinner.

FIG. 5. A RABBIT.

FIG. 6. A DOG. Bend the tail up.

By following directions, all these forms will stand.

Make other animals. Try the frog, using the long edge of the envelope for the back. Make posters with above figures and add free hand cuttings of landscape and other scenery.

## PLATE TEN

### *COLOR PLAY*

FIG. 1. Stripe 9" × 12" paper with colored crayons. Match colors in autumn leaves, in flowers, and in samples of cloth. Try to show contrast in values and spacing. Roll paper to form horns, cornucopias, May baskets, wands, and stick candy.

FIG. 2. A FAN. Put a water wash on circle. Drop in color found in a fall or spring flower. Make a fan by cutting out handles and pasting on each side of circle.

Make stained glass windows with floated color.

Blow and paint soap bubbles.

FIG. 3. BIRD FLYING. Cut freehand the body of a robin. Fold paper and cut wings. Attach wings on center crease to the back of the robin, and suspend by a long thread. Color with crayons.

Cut and color all birds found in locality of the school.

## GRADE TWO

---

### PLATE ONE

#### *SEED ENVELOPES*

Turn paper, 6"×7", with short edge in front. Fold up  $\frac{1}{2}$ ". Fold upper edge down to crease. Turn paper with creases running up and down. Fold lower edge up  $\frac{1}{2}$ ". Fold upper edge down 1". Unfold. Cut out as shown in the diagram. Paste side and bottom margins. On the front of envelope make free-hand cutting of vegetables or flowers from colored paper, showing the kind of seed contained in envelope.

Have classes make seed envelopes of different sizes and shapes. Brown wrapping paper is excellent for this work. Collect seeds from school gardens in the fall, and keep for spring planting. Envelopes made in this way could be used for holding holiday cards which have been decorated with cut letters and rhythm borders adapted from Plate Five, Grade Two. Rabbit units from Plate Two, Grade Two, would be a pleasing decoration for Easter cards.

### PLATE TWO

#### *ANIMAL CUTTINGS*

ANIMAL CUTTINGS BASED ON SQUARES, AND VERTICAL AND HORIZONTAL RECTANGLES. After a cutting of some particular animal has been dictated according to the drawing, let the child cut, freehand, a larger or a smaller square or rectangle, and cut same animal from memory. After sufficient practice in this exercise, make and design booklet cover using animal cuttings for the decoration, either in the form of a single unit or a border. For example, cut animal from paper of a middle value, mount on a square of dark value, and place on a booklet of a light value. Variations of color harmonies may be worked out.

In the fall, make squirrel booklets. Use rabbit unit for Easter card decoration. Use sheep for booklet illustrating the wool industry. (This work may be correlated with the weaving problems.) Make the sheep booklet of bogus paper, filling pages

with cuttings and drawings of a sheep, a flock of sheep in the meadow, the shepherd, the sheep shears, the cards, spinning wheel, pictures of woolen mills, samples of yarn and cloth. Mount pictures taken from magazines illustrating this industry.

### PLATE THREE

**TEA MAT.** In a circle corresponding to the one on chart, draw a design which allows for three side openings and a center opening. Suggestions for design are shown above diagram. Fill in design with colored crayon. After the design is made, cut out openings and trace on 6"×6" strawboard. (Have upper grade children cut out strawboard circle and openings.) Wrap the strawboard circle with natural colored raffia and one color, as illustrated. Raffia should be wrapped in a damp cloth one hour before using. Each strand of raffia must be smoothed out, before it is wrapped around strawboard. When a new strand is needed, simply overlap without tying ends. Finish wrapping all parts of design in one color before starting a second color. In this way it is not necessary to cut strands as often.

### PLATE FOUR

**BLOTTER CASE.** Turn paper, 9"×12", with short edges in front. Fold lower edge to upper edge. Unfold. Give each child a piece of paper, 1 $\frac{1}{4}$ "×1 $\frac{1}{4}$ ", with which to measure on the 9"×12" paper. Fold up lower edge 1 $\frac{1}{4}$ ". Fold down upper edge 1 $\frac{1}{4}$ ". Fold over left edge 1 $\frac{1}{4}$ ". Fold over right edge 1 $\frac{1}{4}$ ". Unfold paper (Fig. 1). Turn with the long edge in front. Again use the measure and draw the square 1 $\frac{1}{4}$ ", next to the upper right square, and cut on the left edge (Fig. 2). Do the same on lower margin. Draw a square on the upper margin at the left of the middle crease and cut on the left and lower edges. Draw a square at the right of the middle crease and cut on the right edge only. Do the same on lower margin. Cut off margins marked X. Fold back diagonally the squares indicated in Fig. 3. Fold A and B to the right. Fold strip C to the left. Fold top strip down and lower strip up (Fig. 4). Fold corners in place in same way (Fig. 5). Insert blotter 4 $\frac{3}{4}$ "×6 $\frac{1}{2}$ ". Decorate cover with cut design.

Advertising blotters may be used in place of those made from large sheets of blotting paper. The dimensions of the case may be made to fit any size blotter.

## PLATE FIVE

*CHRISTMAS GIFTS*

**GREEN BLOTTER DECORATED BY CUT LETTERS AND RHYTHM PAPER RIBBON.** Cut letters based on a square. This is given to the class by dictation, one step at a time. Cut long narrow strips of paper and practice rhythm borders in colored crayons.

**CALENDAR.** Work out a weaving design for a Christmas motif on squared paper. Take paper the size of the design plus two inches in length. Allow this space below the design to mount the calendar pad. Fold top to line two inches from the bottom. Cut into  $\frac{1}{4}$ " strips from center. Crease to within  $\frac{1}{4}$ " from top. Open. With  $\frac{1}{4}$ " strips weave the design.

**BOOK-MARK.**  $3\frac{1}{2}$ "  $\times$  4" red paper. Fold back on dotted lines. Cut out notch in center of lower margin. Paste overlapping margins as illustrated. Add design.

**CHRISTMAS CANDY BOX.** Hectograph pattern of box. Cut on the heavy line. Fold on the dotted line. Bind the top by a double strip of paper. Add handle.

**ROUND BOXES** may be made in the same way by drawing one circle within another, using the smaller circle for the base. Cut the openings between the circles for the sides, and bind the top by a folded band of paper. Square boxes could be worked out in a similar way.

## PLATE SIX

*ESKIMO WORK*

**ESKIMO CANOE (Kayak).** 3"  $\times$  9" paper. Fold into sixteen rectangles. Turn paper with short edge in front. Fold each rectangle in half, making thirty-two small rectangles. Cut on heavy lines. Fold on dotted lines. Paste the short edges together with folded flap inside. Paste long overlapping edges together, leaving an opening in the center. (See illustration.) Cut Eskimo and a double-bladed paddle and place in canoe.

**SLED.** 6"  $\times$  9" paper. Fold into sixteen rectangles. Turn paper with long edge in front. Fold lower edge to bottom crease. Fold upper edge to top crease. Turn paper with short edge in front. Fold lower edge to bottom crease. Fold upper edge to top crease. Cut according to diagram. Paste runners double.

**ESKIMO BOY.** Dress a clothes pin with cotton wadding, using paste.

With the above material, make Eskimo sand table. Use inverted bowls for the igloos, cotton for snow, blue paper and glass for ice.

## PLATE SEVEN

### WEAVING PROBLEMS

**FIG. 1. BAG FOR MARBLES,** made on bobinet and woven with sansilk thread. Plan striped design with colored crayons on paper before starting to weave. At the left and right edges leave little loops to avoid pulling or puckering. Trim edges, and stitch end and sides on the sewing machine. Make heavy draw strings by twisting a double thread.

**FIG. 2. COIN PURSE ( $3'' \times 3''$ ).** On  $5'' \times 7''$  strawboard, make dots  $\frac{1}{4}''$  apart. On the back tie two brass rings in the center; then string up the loom, bringing the warp through the brass rings. (See illustration front and back views.) Place knitting needles on each side of the front to keep the edges straight. Finish the top of the weaving by knotting the last row of woof to each strand of warp. Break the strawboard loom, remove the bag, and sew up the sides of the bag.

**HAMMOCKS** may be woven in a similar manner. The line of dots, through which the warp is strung, should be slightly curved, making the hammock wider in the center. This gives better shape to the finished project.

## PLATE EIGHT

### WEAVING INDIAN BLANKET

Give each child  $6'' \times 9''$  bogus paper, showing  $\frac{1}{2}''$  checks which have been hectographed. Fold long edges together. Cut design as in Fig. 1. Before cutting stencils, make designs with crayons in the two large spaces given on the chart (Fig. 2). Weave the same design on  $6'' \times 9''$  bogus paper with red, gray, and black strips,  $\frac{1}{2}'' \times 6''$ .

**FIG. 3.** Weave design in gray, red, and black yarns, using strawboard for a loom. Have an uneven number of dots through which to string the warp. Support the sides of the weaving by long darning needles or spokes taken from an old umbrella. This keeps the sides of the rug straight.

## PLATE NINE

## FEBRUARY WORK

VALENTINE I. 6"×9" red paper, 6"×9" manila paper. Fold paper in book form, and tie with raffia. Cut out openings on cover to form a heart-shaped stencil.

VALENTINE II. 4" white circle, 3½" red circle. Fold red circle into eight equal parts (Fig. 1). Cut a curved line from side A within ⅛" of side B. Cut curved line from side B almost to side A. Continue until the center is reached. Fasten a red cord in center by tying a knot on the under side. Paste a small red heart in center of white circle. Put paste on edges of red circle and paste to white circle. In pulling the cord, the red circle will be extended and the red heart discovered.

BOOK MARKS. Decorate with cut designs. It is interesting to make figures of heart shapes—solid hearts for the head and body, outside margins of one-half hearts for arms and legs.

LOG CABIN. 8"×8" bogus paper. Fold into sixteen squares. Cut on right edge of lower left square; on right edge of lower second square; on right edge of lower third square. Same on upper edge. Overlap and paste the two cut center squares. Overlap corner squares as far as possible and paste. This forms the house. Construct chimney of 3"×4½" bogus paper, by following diagram. This may be dictated to the children or hectographed. Draw the logs and stones on finished house with brown crayon. For a more pretentious log-house, narrow strips of paper may be used instead of the brown crayon. These strips should project at the corners and ends of the house in log cabin style.

## PLATE TEN

## BIRD GAME

Cut out bird and wings from the chart and use as pattern. Insert wings in the slits A and B, and paste. Paste sides of bird together. Color with crayons. Make a nest of a strip of brown paper, 2"×14". Overlap and paste short ends together. Each player has two birds and stands three feet from the nest which is placed on the floor. He then tries to throw the bird into the nest. Each successful attempt counts two, ten being the winning point. For this game, make all the birds that are common in the community. A teacher should make this most interesting and instructive by correlating with the nature work. Draw birds free-hand with colored crayons. Study and draw the large varieties of nests and eggs.

## GRADE THREE

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### PLATE ONE

#### *CUT PAPER COMPOSITIONS*

**POSTERS.** Use colored papers or paint manila paper with flat washes of the desired tones. For an autumn poster, use color scheme from a maple leaf. Make posters for the four seasons. Cut foreground, and mount on a rectangle the size of the poster, leaving upper part for the sky. Add distance, trees, etc. Illustrate language and history by cut paper posters.

Make one poster, using a tint and a normal of one color. Mount on a neutral tone. This makes a practical application of the color chart which should be worked out in each grade.

By posters, illustrate the different sections of the country, such as level ground, hillsides, mountains, and seashore; also use trees common to locality in poster compositions.

### PLATE TWO

#### *THANKSGIVING PAGE*

A **TURKEY** cut from a  $3\frac{1}{4}$ " square. Fold the square on the diameters and one diagonal. Cut corners first, following the diagrams. The letters in "T IS FOR" are cut from 2" squares of black paper. Fold on vertical diameter to cut T, O, and R. Mount letters and turkey on 9" x 12" bogus paper.

**FIGS. 1, 2, and 3** are place cards for the Thanksgiving dinner. Make original place cards by cutting squares and filling the space with simple motifs. Holland figures, windmills, Dutch boats, the Mayflower, spinning wheels, Pilgrim cradles, and fruits and vegetables are appropriate motifs for design. Paint in orange and black.

## PLATE THREE

*CHRISTMAS GIFTS*

Decorate Christmas tags, seals, calendars, and blotters with designs cut out and mounted on a contrasting tone of paper, as red and green. Cut letters for blotters of a tint, mounted on a normal of the same tone, as light green letters and green background. In making the letters, first cut two long strips the desired width. Place on background. Decide upon the length, leaving suitable margins. Then divide and cut the top strip into five equal rectangles for the word "Merry," and the lower strip into four equal parts for "Xmas." Cut the letters.

Design booklets for special days with cut letters. Make a cover for the spelling book.

## PLATE FOUR

*CHRISTMAS CARDS*

**CHRISTMAS POST CARDS.** On  $\frac{1}{4}$ " squared paper,  $3\frac{1}{4}" \times 5\frac{1}{2}"$ , make realistic sketch. Then adapt to the checked paper, following the horizontal and vertical lines as closely as possible. Cut out designs. Color the plain side with crayons. Mount on white paper, post card size, or on a real post card.

Christmas booklets could be decorated in the same way. Use motifs suggested, also make original designs.

These motifs might be enlarged a trifle, cut out, and used as a stencil to decorate bags, pillows, and table runners made of unbleached muslin. Stencil with crayola. After finishing, press with hot iron to set the color.

## PLATE FIVE

*STICK PRINTING*

**FIG. 1. HANDKERCHIEF CASE.** Two pieces of strawboard,  $3\frac{1}{2}" \times 3\frac{1}{2}"$ ; two pieces of canvas,  $4\frac{1}{2}" \times 4\frac{1}{2}"$ ; two pieces of canvas,  $3\frac{1}{4}" \times 3\frac{1}{4}"$ . Spread paste on cardboard. Attach to canvas, keeping all margins even. Cut off corners diagonally. Be careful not to cut too closely to the corner of strawboard. Paste sides down. Attach the lining  $3\frac{1}{4}" \times 3\frac{1}{4}"$  to the under side of the strawboard. Repeat for second piece. Stick-print a design on the top, first making several designs on  $\frac{1}{4}"$  checked paper. Handkerchiefs are

held in place by an elastic band. Color white elastic with water colors, the same tone as the canvas.

**FIG. 2. CROCHET NEEDLE CASE.** Cut  $1\frac{1}{4}$ " cardboard circle. Cover with circle of canvas  $1\frac{3}{4}$ " diameter. Paste margins of canvas to one end of round cardboard mailing tube,  $1\frac{1}{4}$ "  $\times$  10". Stick-print border on each end of canvas  $4\frac{1}{2}$ "  $\times$   $10\frac{1}{2}$ ", allowing  $\frac{1}{2}$ " on one end and  $\frac{1}{2}$ " on long side for lapping. Put paste on tube. Cover sides with canvas. Use a cork in the top. Cover larger tubes for pencil cases.

**BUTTON BOX.** Paste together, one on top of the other, three small sliding-in boxes. Cover top, bottom, and sides with strips of canvas. Add design. Use a collar button or a staple for the knob of each box.

## PLATE SIX

**SCRATCH PAD.** Measure and cut materials according to diagrams. Spread with paste the 6"  $\times$  9" cover paper. Attach 4"  $\times$  7" cardboard to cover paper, keeping top, bottom, and side margins even. Turn cardboard and cover paper, and iron out all wrinkles and air bubbles carefully with palm of hand.

Turn cardboard and cover paper over on clean piece of scrap paper in order not to get any paste on outside of cover. Fold over margins to back of cardboard as directed in illustration. Fold corner I over at right angles to edge. Fold the other three corners in same manner. Spread paste over folded down corners and fold margins, first at top II, then side margin III, bottom IV, and side margin V. Be careful to attach paper to edge of cardboard all around in pasting margins over to back.

Fold the  $1\frac{1}{2}$ "  $\times$  6" paper band  $\frac{3}{8}$ " from long edge on either side. Then open, spread with paste, and refold. Place band on front of cardboard 1" down from top. Attach ends to back of cardboard.

Spread the  $3\frac{3}{4}$ "  $\times$   $6\frac{3}{4}$ " lining paper with paste and place on back of cardboard, allowing even margin of  $\frac{1}{8}$ " all around. Spread with paste the paper for top of pad and place on the top. This covers the commercial band across the top of pad and brings it into color harmony with the mount. Slip cardboard back of pad under band on mount as far down as it will go. The band is arranged to give correct marginal spacing around pad when mounted.

**SUGGESTIONS FOR VARIATION OF PROBLEMS.** This mount may be made of heavy paper instead of cardboard. Cut paper

size of cardboard,  $4'' \times 7''$ . Paste band over and cover back with another  $4'' \times 7''$  paper.

**DESIGN.** Stick printing may be used around pad on mount, or a design may be placed on top cover band of pad. This may be in stick printing or paper cutting. Keep to a very simple straight line design. Insist upon careful workmanship in this first all-over pasting problem.

**CLIPPING CASE.** One paper  $8'' \times 10\frac{3}{4}''$ , two papers  $3'' \times 3\frac{3}{4}''$ . Follow given measurements, score the horizontal lines, and fold. From the center of upper flap draw and cut slant lines, making a slight variation of shape for the outside flap. Fold two pieces  $3'' \times 3\frac{3}{4}''$  in and out on light lines, and paste to sides of case to form a pocket. Insert brass staple in center of outside flap. Fold case and fasten by cord or piece of raffia.

## PLATE SEVEN

### *EASTER ENVELOPES AND CARDS*

**FIG. 1. ENVELOPE.**  $9'' \times 9''$  paper. Fold lower edge to upper edge. Keep paper folded. Fold lower edges within  $\frac{1}{2}''$  of upper edge. Unfold. Fold left edge to right edge. Keep paper folded. Fold right edges one-half way to left edge. Unfold. Cut out corners and slant the sides. First make the flap follow the contour of the envelope, then make modifications. Place folded pattern on fresh sheet. Trace around and cut out. This prevents the crease from showing through the center of envelope on the finished project.

Decorate cards by filling in square with rabbit motif.

**FIG. 2** is a strip of floated color, showing the colors found in a spring flower. Mount on card to fit the envelope.

## PLATE EIGHT

### *BOXES*

**WOVEN PAPER BOX.**  $9'' \times 9''$  paper. Fold into sixteen squares. Cut out the corner squares. Divide and cut the sides into  $\frac{1}{2}''$  strips (Fig. 1). Weave with strips of a different color, two  $\frac{1}{2}''$  and two  $\frac{1}{4}''$  strips  $18\frac{1}{2}''$  long. Finish one side, turn down every other vertical strip, and paste ends on the inside of box. Crease the corner. Continue on each side in the same way. Finish the inside of box by pasting one strip at the top to strengthen the upper edge. Add handle.

**POPCORN BOX.** Two pieces  $3'' \times 9''$ . Follow the measurements given in the drawing and cut out patterns (Fig. 2). Paint a design, or paste a cut-out paper design on each side. Cross the two pieces at right angles (Fig. 3). Paste the middle squares together. Fold up sides. Punch the holes and add the cord.

These problems could be used either for Christmas tree decorations filled with candy, or for May baskets filled with flowers.

## PLATE NINE

**CANDY BOX MADE WITHOUT PASTING.** Paper  $9'' \times 12''$ . Fold into three equal parts, making three oblongs  $4'' \times 9''$ . Unfold (Fig. 1). Fold left edge to first crease. Fold right edge to first crease (Fig. 2). Keep folded. Turn paper on other side. Fold left edge to right, and right edge to left so they will meet in the center (Fig. 3). Turn top right oblong to the left. Fold upper right corner down. A diagonal is formed from the upper middle crease. Turn upper left corner, using only the top oblong. Do the same on lower corners (Fig. 4). Turn two left oblongs to the right (Fig. 5). Fold corners (Fig. 6). Turn top right oblong to the left (Fig. 7). Fold down triangles on lines A, B, C, and D, making Fig. 8. Open from center into box form. Fold the cover of the box in the same way. Add design, first drawing it on checked paper.

Fold boxes of different shapes, as the problem can be made of paper of any shape and size.

## PLATE TEN

### RAFFIA WORK

**TEA MAT.** Cut strawboard circle  $6''$  in diameter, inner circle  $2\frac{1}{4}''$  in diameter; strawboard circle  $5\frac{3}{4}''$  in diameter, inner circle  $2\frac{1}{4}''$ . Cut out center circles and place the two pieces together with the smaller one on top. With raffia strands  $13''$  long, wrap frame. Place center of raffia on the circumference on the outer circle. Bring ends through the opening. Twist raffia to the right. Form into a small loop and tuck ends between two pieces of strawboard.

Picture frames could be made in the same way with the opening made a trifle larger.

## GRADE FOUR

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### PLATE ONE

#### *CUT PAPER COMPOSITIONS*

Paint three pieces of 6"×9" manila paper, a tint, a normal, and a shade of one tone. From these papers, cut our autumn and winter posters.

Make posters of realistic color schemes.

Cut spring posters, using birds, birds' houses, and spring flowers in composition.

This work may be used to illustrate language and history lessons. In connection with the nature work, cut the poplar, apple, oak, pine, and willow trees. Place in a composition.

As the geography work consists of the study of the home state, make a poster illustrating the characteristics of the locality.

### PLATE TWO

#### *HALLOWEEN LANTERNS*

Turn black paper, 9"×12", with the long edge in front. Draw a vertical line  $\frac{1}{2}$ " in from left edge. Divide the remainder of the paper into four equal parts. An easy way to do this is to fold right edge to vertical line, keep folded, and fold again from right edge to vertical line. Divide the short edge according to directions under the diagram. Draw the horizontal lines. Find center of top edges of upper rectangles. Connect with lower corners of rectangles by slant lines.

Cut as indicated by the heavy lines in diagram. Score the edges to be folded. Trace and cut out designs for the four sides. Line with orange tissue paper. Paste sides together. Fit and paste Fig. 1 in the top so as to have a  $\frac{3}{4}$ " projecting roof. Do the same at lower edge, using Fig. 2 for the base.

## PLATE THREE

*BLOTTER PAD*

**WOVEN BLOTTER ENDS.** Fold two pieces,  $1'' \times 12''$ , on the long axis. With these strips bind long edges of cardboard,  $9'' \times 12''$  (Fig. 1). Paste paper  $8\frac{3}{4}'' \times 11\frac{3}{4}''$  on the top of cardboard. Draw line  $\frac{1}{4}''$  from upper long edge of end paper,  $2\frac{1}{2}'' \times 10''$ . Score on this line. Spread paste on  $\frac{1}{4}''$  wide rectangle and attach to  $2\frac{1}{4}''$  wide rectangle, making a firm edge (Fig. 2). Draw a line  $\frac{1}{2}''$  from lower long edge (Fig. 2). Fold upper edge to this line. Measure and cut into strips  $\frac{1}{4}''$  wide, leaving  $\frac{1}{2}''$  on each end for pasting (Fig. 3).

Draw design on  $\frac{1}{4}''$  squared paper. Weave design on blotter ends with colored paper strips  $\frac{1}{8}'' \times 9''$ .

Paste blotter ends in place. Spread lining paper,  $8\frac{3}{4}'' \times 11\frac{3}{4}''$ , with paste and attach to back. Insert blotter.

**BOX WITH WOVEN TOP.** Fold  $9'' \times 9''$  paper into sixteen squares. Cut on heavy lines as illustrated in Fig. 5. Fold top to bottom. Place dots on lower edge of the two middle squares  $\frac{1}{2}''$  apart. Draw vertical lines  $1\frac{3}{4}''$  long from crease. Cut on these lines. Weave design with  $\frac{1}{2}''$  wide strips, pasting ends to inside of box. (More interesting designs can be woven when the top is divided into  $\frac{1}{4}''$  wide strips.) Paste in box form.

Fold and cut bottom of box the same as top, using  $8\frac{7}{8}'' \times 8\frac{7}{8}''$  paper, as illustrated in Fig. 5.

## PLATE FOUR

*CHAINS*

**CHAINS OF SILK CORD OR TWINE, AND BEADS OR NUTS.** Draw designs of long and short lines before making chains. Make finger crochet and knots in the cord. Finger crochet is made by tying a single bow knot and pulling a loop of the cord through the loop of the single bow, thus forming a loop within a loop. Continue pulling one loop within another, each time pulling the loop tight. Finish by drawing the end of the cord through the last loop.

The curtain cord is made of reed, brown twine, and a hazel nut for a charm. To string the nuts, burn holes from end to end with a red hot wire.

## PLATE FIVE

## CANDY BOXES

FIG. 1. POINTED BOX. Colored paper  $6\frac{1}{2}'' \times 10\frac{1}{2}''$ . Measurements on long edges are  $\frac{1}{2}''$ ,  $2\frac{1}{2}''$ ,  $2\frac{1}{2}''$ ,  $2\frac{1}{2}''$ ,  $2\frac{1}{2}''$ ; on short edges  $2''$ ,  $2\frac{1}{2}''$ ,  $2''$ . Find center of top edges of upper rectangles. Connect with corners by slant lines. Measure  $\frac{1}{2}''$  down from apex of triangles and draw horizontal line. Cut on the heavy lines. Score lines to be folded. From  $1'' \times 1\frac{1}{2}''$  oblongs, cut stencils of contrasting tone of paper. Paste on the four sides. Fasten top and lower points with cord.

FIG. 2. SQUARE BOX.  $12'' \times 12''$ . Divide paper into  $1\frac{1}{2}''$  squares. Cut on heavy lines as shown in diagrams. Intersect opposite sides on lines A and B, and C and D, keeping triangular flaps on the top (Fig. 2). Notice that these boxes are made without pasting.

## PLATE SIX

## BAGS AND TRAYS

FIG. 2. WOVEN COIN PURSE. Strawboard loom,  $4'' \times 6''$  (Fig. 1). Turn with short edges in front. Draw horizontal lines  $\frac{1}{2}''$  from each edge. On these lines place dots  $\frac{1}{8}''$  apart. String warp of sansilk thread on both sides. Weave with double thread. As there must be an even number of dots, use two strings of warp as one string on one side so as to make an uneven number in weaving. Show stripes in a shade of the same tone as bag.

The center design is made by weaving under two and over two. Weave until the bag is  $3'' \times 4''$ . Remove the loom by breaking the strawboard. Add a thread of a contrasting color (dotted line on chart) with a needle. Twist cord of the two values of thread used and fasten ends with beads or small hazel nuts for the draw strings.

FIG. 3. INDIAN TRAY. Oval shape, short axis  $3\frac{3}{4}''$ , long axis  $6''$ . Use No. 2 reed, natural colored raffia, orange and brown raffia. Soak end of reed until it bends easily. Bend one end of reed to form a loop  $2''$  long. Thread a large tapestry needle with raffia. Cover reed by using the Figure Eight stitch (Fig. 4), which is over and around the top reed, between the reeds, over and around the lower reed. Repeat. At the turn of the loop, begin the Lazy Squaw stitch (Fig. 5), which is made by wrapping the raffia from you, twice around the reed and then

bringing the needle through the nearest coil. Proceed wrapping twice around the reed and bringing the needle through the nearest coil. Fasten the third coil to the second, the fourth to the third, etc. When the reed is used up, splice on a new piece.

Sketch a simple design in the oval on chart. When using colored raffia, let the natural raffia thread run along with the reed, bringing it out when the design calls for it.

## PLATE SEVEN

**MAGAZINE COVER.** Heavy paper,  $12'' \times 17\frac{5}{8}''$ . ( $9'' \times 12''$  paper may be used by overlapping  $\frac{3}{8}''$  on short edges and pasting.) Cut on top and bottom edges according to diagram (Fig. 1). Decorate with stick printing, first working out design on checked paper.

Make textbook covers and decorate with stick printing or cut-paper designs, using appropriate motifs. If possible, have the wood sticks for printing made by the manual training department. Cut squares, triangles, and circles of small sizes. Water colors mixed with alcohol may be used successfully in place of dyes.

Make a pad of several layers of cloth, saturate with solution, and apply the stamp. Print on practice paper several times until the stick has absorbed the solution evenly.

## PLATE EIGHT

### *ANIMAL DESIGNS*

Enclose picture of an animal in a rectangle (Fig. 1). Use tracing paper over picture. Divide the space into diameters and sub-divisions (Fig. 2). Draw animal in straight lines. Cut paper same size as rectangle around animal. Fold on diameters. Cut off corners, following the straight line design (Fig. 3). Make larger and smaller cuttings until form of animal is memorized.

**ANIMAL CALENDARS.** Paint straight line drawing in black, leaving white between rectangle and animal. Leave white also to separate parts of animals where possible (Fig. 4). Notice the spacing between the bill and head of the duck.

Let children collect pictures of animals, each child working out a different design in straight lines and division of parts as directed. This lends greater interest and variety to the work.

## PLATE NINE

**PICTURE HOLDER.** Spread paste on cover paper  $5'' \times 6\frac{1}{2}''$ . Attach strawboard  $4'' \times 5\frac{1}{2}''$ , keeping margins even on all sides (Fig. 1). Cut corners diagonally. Paste margins to the back of strawboard. Fold piece,  $1\frac{1}{2}'' \times 5''$ , one-half inch from each long edge. Paste A and B, making a strip  $1'' \times 5''$ . Fold vertical lines  $\frac{1}{2}''$  from the short edges. Cut out corners marked X (Fig. 3). Place on lower edge of  $4'' \times 5\frac{1}{2}''$  piece. Paste lower flap C and side flaps to the back. Cover strawboard,  $1\frac{1}{2}'' \times 4''$ , with paper,  $2\frac{1}{2}'' \times 5\frac{1}{2}''$  (Fig. 2). Attach lining paper,  $1\frac{1}{4}'' \times 5''$ .

Cut a slit in the back of lining piece,  $4'' \times 5\frac{1}{2}''$ . Insert standard  $1\frac{1}{2}''$  from top (Fig. 4), and paste. Paste this lining to back of piece,  $4'' \times 5\frac{1}{2}''$ . Stick printing or a simple line design could be added to the narrow strip (Fig. 5).

**SUGGESTIONS FOR VARIATION OF PROBLEM.** Make holder to place on desk for the Constructive Design plate ( $7\frac{1}{2}'' \times 10''$ ). Also make standards on which to put flowers for nature drawings.

**WHISK BROOM HOLDER.**  $9'' \times 12''$  heavy paper. Draw oblong  $5'' \times 7\frac{1}{2}''$ . On lower edge measure from each end  $\frac{1}{2}''$ . Connect with upper corners. On the right slant edge measure up  $4\frac{1}{2}''$ . Draw oblong  $\frac{3}{4}'' \times 4\frac{1}{2}''$ . On practice paper, cut out shape of the front which is the same as the lower part of the back. Place pattern in position. Trace around it. Add  $\frac{3}{4}'' \times 4\frac{1}{2}''$  oblong and  $\frac{1}{4}''$  strip for the flap. Draw design on squared paper and transfer. Paint the design in a shade of the same tone as the paper.

## PLATE TEN

## "MY TREE" BOOKLET

Fold  $9'' \times 12''$  cover paper, short edges together. On front of cover paper draw marginal lines  $\frac{7}{8}''$  from top,  $\frac{5}{8}''$  from sides,  $1\frac{3}{8}''$  from bottom. Inside these marginal lines draw a rectangle  $1\frac{1}{2}''$  wide,  $\frac{3}{8}''$  from top marginal line, and  $\frac{3}{8}''$  from side marginal lines. This spacing should be worked out by the teacher as an example of ideal marginal spacing. (Should the measurement prove too difficult for any particular class, the children could draw a similar spacing freehand.)

Cut letters from small oblongs,  $1'' \times \frac{1}{2}''$ , for the title "My Tree." Arrange them in the smaller rectangle on cover, and trace around

them. Paint letters and marginal lines a darker tone than that of cover.

Fold three sheets of paper  $8\frac{1}{2}'' \times 11\frac{1}{2}''$ , short edges together. Place one inside of the other, making what is called a section. Rule marginal lines on all pages but the second and last, top line  $\frac{7}{8}''$  from top edge, side line  $\frac{5}{8}''$  from side edges, bottom line  $1\frac{3}{8}''$  from bottom edge. Place this section inside of cover paper. Open booklet to center sheet. Rule down from upper edge  $2\frac{1}{2}''$  and up from bottom edge  $2\frac{1}{2}''$ . Punch holes and tie with cord the color of cover paper. If cord is heavy, tie on the outside of booklet; if light, tie on inside of booklet. Beginning at third page and ending with page 11, number pages at bottom under marginal line in center.

On the first page, draw a rectangle according to dimensions given for cover. In this rectangle print the name of the tree and below it the words "My Tree." This is called the title page.

The pages as numbered should be as follows:

- Page 2. Blank.
- Page 3. "My Tree" in March.
- Page 4. Twig from "My Tree" in March.
- Page 5. Birds seen in "My Tree" and dates.
- Page 6. Dates when blossoms and leaves appear.
- Page 7. "My Tree" in May.
- Page 8. Twig from "My Tree" in May.
- Page 9. Pressed leaf from "My Tree."
- Page 10. Pressed blossom from "My Tree."
- Page 11. Something about "My Tree."
- Page 12. Blank.

**SUGGESTIONS FOR VARIATION OF PROBLEM.** The cover of the booklet may be made of bogus paper, with inside section of cream or gray manila, or white drawing paper. The cover may be painted in a darker tone of gray water color or done in black crayon. If black crayon is used, the booklet may be sewed with black darning cotton, knotted on the inside of the section. If water color is used, the booklet is more attractive tied with a heavy gray cord. Brown cover paper is good with the cream manila paper for the inside section. The title and marginal lines might be cut from the cream manila paper and mounted on cover. *Insist upon correct marginal spacing in all work.*

**NOTE.**—Be sure that pupils are on the alert for those trees which have blossoms before they have leaves.

# GRADE FIVE

## PLATE ONE

### *HALLOWEEN LANTERNS*

FIG. 1. CAT'S HEAD. 9"×12" black paper. Cut on the heavy lines according to diagram. Score and fold on the light lines. Line the openings with orange tissue paper. Cut out small circle of green tissue paper and paste in center of eye for the pupil. Paste candle holder to the base of lantern.

FIG. 2. OWL'S HEAD. 9"×12" bogus paper. Fold and cut same as Fig. 1. Cut out two circles for eyes and line with orange tissue paper. The other light parts are bogus paper. Fill in the dark parts with black paint.

Make frog's head, using very large green circles with orange centers for the eyes, and a large crescent-shaped opening for the mouth.

## PLATE TWO

### *POST CARD HOLDER AND FRAME*

FIG. 5. POST CARD HOLDER. Spread paste on cover paper, 5½"×8". Attach strawboard, 4½"×7", leaving even margins (Fig. 1). Cut corners diagonally and paste sides back (Fig. 1). Cover strawboard, 4½"×4½", with cover paper, 5½"×5½". Leave even margins. Paste three sides to back of strawboard (Fig. 2). Draw line down center of long axis of cloth hinge, 1"×4½" (Fig. 3). Attach one-half of cloth hinge to free flap of cover paper and one-half to strawboard. This gives both a paper and cloth hinge. Attach other half of hinge to back of strawboard, 4½"×7". Attach linings, 4¼"×6¾" and 4¼"×4¼", to backs of strawboard. Punch holes and tie the sides with raffia or cord. Cut stencil design of light value of paper and mount on dark value of its complement. Paste in the center of 4½"×4½" paper.

FIG. 9. POST CARD FRAME. On 5¼"×7¼" strawboard draw 1" margins. Cut out inside oblong. Spread paste on 6¼"×8¼" cover paper. Attach strawboard mat, leaving even margins. Cut corners diagonally. Paste sides to back of strawboard. Cut

out inner oblong from cover paper, allowing  $\frac{1}{2}$ " margins for turning back and pasting (Fig. 6). Add lining  $5'' \times 7''$ . Cover  $4\frac{3}{4}'' \times 6\frac{3}{4}''$  strawboard with  $5\frac{3}{4}'' \times 7\frac{3}{4}''$  cover paper. Cut corners diagonally (Fig. 7).

Cover  $2'' \times 5''$  strawboard with  $3'' \times 6''$  cover paper (Fig. 8). Line with  $1\frac{3}{4}'' \times 4\frac{3}{4}''$  paper. Score a line  $1''$  from the top. Strawboard might be cut  $2'' \times 4''$ , using only cover papers to insert through slit. Insert standard in the back of cardboard,  $4\frac{3}{4}'' \times 6\frac{3}{4}''$ . Paste. Paste sides and bottom of back to frame. Insert post card in the top.

### PLATE THREE

**CLIPPING CASE.** Measure and cut all materials according to directions. Rule rectangle  $\frac{5}{8}''$  wide down center of outside hinge. Rule line in  $\frac{7}{8}''$  from long edge, the length of cardboard. Place guard paper up to this line and spread paste on cardboard. Place hinge right side down on clean pasting paper. Then turn cardboard over on hinge up to line of rectangle, keeping top and bottom margins of hinge the same. Turn to right side and carefully iron out all wrinkles or imperfections in cloth with palm of hand.

Repeat this process with the other cardboard, placing ruler against top edge to see that both cardboards are evenly pasted to hinge. Spread paste on top and bottom margins of hinge and paste to back of cardboard. Crease over edge of cardboard with finger nail and paste to hinge between cardboards.

Spread paste on cover paper. Place on outside of cardboard, covering hinge  $\frac{1}{16}''$ . Keep head, tail, and fore edge margins even. Cut corners diagonally  $\frac{1}{8}''$  from corners of cardboard. Fold over and paste margins to back of cardboards, first pasting the edge plane of cardboard and creasing carefully but sharply on both sides of edge. Fold the nine inside hinges, lengthwise, down center.

Spread paste on one side of fold of first hinge; attach to front of envelope.

Spread paste all over back of second hinge. Paste one-half to back of first envelope, and the other half to the front of second envelope, keeping the fold of the hinge to the back edge of envelope and opening to the fore edge.

Continue until envelopes are all hinged together. Cover free sides of first and last hinges with paste and attach to cardboard, the fold of the hinge being even with back edge of cardboard.

Spread end sheets,  $3\frac{5}{8}'' \times 6\frac{1}{2}''$ , with paste and place on inside of cardboard, keeping back edge even with back edge of cardboard, with margin of  $\frac{1}{8}''$  on head, tail, and fore edge.

SUGGESTIONS FOR VARIATION OF PROBLEM. Envelopes may be constructed of paper  $13\frac{1}{2}'' \times 7\frac{3}{4}''$ , according to illustration. If envelopes are made, end sheets should be of the same paper and of a lighter value than cover papers. The cover may be of linen or silk, and may be made with a hinge or of one piece of material. The design may be a small rectangle correctly spaced on cover, or a border design. The word "Clippings" may be placed on the cover with marginal lines, and on each envelope may be printed its contents. Design may be developed in water color, tempera color, or crayon.

#### PLATE FOUR

MEMORANDUM PAD. Measure and cut all materials according to directions. Draw on outside of cloth hinge a rectangle,  $\frac{5}{8}''$  in width, lengthwise down center. To get this measurement, take the thickness of the pad plus thickness of two cardboards plus  $\frac{1}{8}''$  extra. This extra is to allow room for the opening and closing of the cover boards. Rule line on cardboards lengthwise  $\frac{1}{2}''$  from back edge. Place guard paper up to this line, and spread paste on this  $\frac{1}{2}''$  rectangle. Place hinge on scrap paper. Attach cardboard to hinge up to line of rectangle, keeping top and bottom edges even. Paste other cardboard to hinge, placing ruler against top edges to true them. Cover top and bottom margins of hinge with paste and attach to back of cardboards and hinge. Spread paste on inside hinge and attach to cardboards and outside hinge. Crease hinge down firmly along back edges of cardboards and paste carefully to outside hinge between cover boards. Spread cover paper with paste and place on outside cardboards, lapping over hinge  $\frac{1}{16}''$ . Fold corners and margins as directed in Plate Six, Grade Three, or cut corners diagonally.

Fold cloth threefold lengthwise for pencil holders. Open, spread with paste, and refold. Paste ends together, allowing room to insert pencil in loop. Measure up from bottom on left side and down from top on right side  $\frac{3}{4}''$ , and paste pencil holders to inside of cardboards. Pencil holders might be placed to meet in center of boards. On right board have loop just above the center, and on left board just below center.

On right inside cover paste pad. On left inside cover paste blotter.

**SUGGESTIONS FOR DESIGN.** Design may be applied in a small rectangle correctly spaced, or a marginal border. Keep the design structural, bi-symmetric straight line. In marginal border design, make the design stronger at the corners, connecting with lines or simple design. The binding may also be of block-printed linen. The cover and hinge may be in one piece as shown in the color illustration, which is an Austrian print.

## PLATE FIVE

### TABLE FAVORS

**CANDLESTICK HOLDING A PAPER CANDLE FILLED WITH CANDY.** On a 5" orange paper circle, cut out inner circle,  $1\frac{1}{2}$ " in diameter. Fringe the long edge of a piece,  $1\frac{1}{2}" \times 5\frac{1}{4}"$ , cutting  $\frac{1}{4}"$  in from edge. Fold back the fringe and paste in center as in Fig. 1. Mount on 5" cardboard circle.

Cut  $\frac{1}{2}"$  opening in a  $2\frac{1}{4}"$  circle (Fig. 2), and cut fringe  $\frac{1}{2}"$  long. Fold back fringe and paste within the cylinder, forming a collar at the top.

Roll white paper,  $4" \times 7"$ , into shape for candle. Paste. Cover with white tissue paper,  $7" \times 7"$ , finishing the top with a twist. Paint edges of cardboard with water colors, if not in harmony with cover paper. This can be done in color schemes appropriate for the season and occasion.

**PLACE CARDS.** (1) Construct tent and print name on side for a Washington party. (2) Make landscape compositions on place cards showing the season of the year. (3) Fill rectangles with faces such as the Billiken, Santa Claus, Brownies, Clowns, Puritans, etc.

## PLATE SIX

### CANDY BOXES

**FIG. 1.** Heavy construction paper,  $7\frac{1}{2}" \times 17\frac{1}{2}"$ . Cut on heavy lines according to diagram and score and fold on light lines. Place paste on one side as shown in Fig. 1. Fold in the other sides, and fasten with cord and Christmas seal.

**FIG. 2.** Paper  $10" \times 10\frac{1}{2}"$ . Cut and fold according to drawing. Attach flap to side. Make broken line border designs for the box, first working out design on squared paper, and transferring it to top of box. Make different shaped boxes after the given diagrams.

## PLATE SEVEN

*COMMERCIAL ENVELOPE AND TEXTILE SAMPLES*

**ENVELOPE MAKING.** Design small envelope for samples of striped cloth. Print name of the store and city on the front. On the back devise a way of fastening. Make samples on paper of striped goods in black and white; gray, black, and white; black and one color.

Make business envelopes. Design trademarks and monograms.

Address envelopes so that the spacing is pleasing. Write letters, leaving correct margins at the top, sides, and lower edge.

Envelopes may be filled with sachet powder and fastened with tape through a slit in the upper flap, or with a seal decorated by an appropriate flower or emblem, typical of the sachet used.

## PLATE EIGHT

*BOOKLETS*

**BOOKLETS FOR POEMS.** Two pieces of bogus paper  $6'' \times 9''$ . Cut letters of manila paper. Fold bogus papers with  $\frac{1}{2}''$  margins to the inside on long edges, making oblongs  $5\frac{1}{2}'' \times 9''$ . This makes the left edges stronger for the Japanese lacing. (See Plate Ten, showing steps in sewing.) Fill book with six sheets of manila paper,  $5\frac{1}{2}'' \times 9''$ . Cut strip of paper the desired height of title, and place on the cover, cutting off the ends until the spacing is good. Divide the strip into five equal oblongs for the word "Poems," a letter being cut from each oblong.

**XMAS BOOKLETS AND CARDS.** Decorate with cut designs, using papers painted in complementary colors. Neutralize the tone of the larger shape by adding a little of its complement to the paint. The smaller shapes may be more intense in color.

Make cards and booklets for other holidays and for special occasions.

## PLATE NINE

**GROCERY PAD.** Spread paste on cover paper  $5\frac{1}{2}'' \times 12''$ . Attach to strawboard  $4\frac{1}{2}'' \times 11''$ . Cut corners diagonally and paste margins.

On  $2\frac{1}{2}'' \times 5\frac{1}{2}''$  paper draw a  $\frac{1}{2}''$  margin. Fold down one long edge and paste. This makes a strong outside edge. Cut the

corners diagonally. Paste the sides A, B, and C on the back of the  $4\frac{1}{2}'' \times 11''$  piece. Do the same on the other end. Paste the lining,  $4\frac{1}{4}'' \times 10\frac{3}{4}''$ . Insert white paper for the grocery list.

The ends may be made of linen decorated with stick printing or stencil design.

This project could be used for telephone pad, laundry lists, or menus for the meals of the day.

### PLATE TEN

**TELEPHONE PAD. FIG. 1.** Spread paste on cover paper  $6'' \times 8\frac{1}{2}''$ . Attach strawboard  $5'' \times 7\frac{1}{2}''$ . Leave even margins on all sides. Cut corners diagonally and paste margins to back of strawboard. Insert two brass rings  $4''$  from lower edge and  $1\frac{1}{2}''$  from the sides. Paste lining  $4\frac{3}{4}'' \times 7\frac{1}{4}''$ . Mount the pad, leaving the widest margin at the bottom. Transfer and paint the design.

**FIG. 2. MEMORANDUM PAD.** Fold  $9'' \times 12''$  paper into eight oblongs  $3'' \times 4\frac{1}{2}''$  (Fig. 3). Fold top of colored paper,  $3'' \times 5\frac{1}{2}''$ , down  $1''$ . Fasten together by Japanese lacing with cord and pencil. (See drawing for the steps in sewing.)

# GRADE SIX

## PLATE ONE

### *DECORATING COMMON OBJECTS*

Paint flower pots with oil paints. Keep the designs big and bold. (See Figs. 1 and 2.)

FIG. 3. DINNER HORN FOR THE COUNTRY HOME. Tin candlesticks from the five and ten cent store make very attractive dinner horns when a little color is added.

FIG. 4. Wooden frames for a picture or for a mirror may be painted.

Paint and decorate furniture.

Many tin articles may be made most attractive by bold brilliant designs executed in oil or enamel paints, with the background painted in dull japalac.

Tin cracker and marshmallow boxes, tea cans, tin mail boxes, tea trays, all have possibilities along this line of decoration.

## PLATE TWO

BIRD STICKS. Cut out pattern of birds and trace on bass-wood or soft pine,  $\frac{1}{8}$ " stock. If natural size is desired, make a trifle larger than illustrations. After sawing or whittling out the bird, fasten to a rod 15" long. By soaking the end of the rod and the bird's foot in water, a pin can easily be inserted. (Fig. 1 shows another way of fastening the bird to the rod.)

Paint birds in water colors, oil or enameled paints. Robin: head and bill black with white spots over the eyes; back, wings, and tail dull brown; breast, dull red orange. Goldfinch: yellow with black spots. Bluebird: head, back, wings, and tail, bright blue; breast, dull orange. Scarlet Tanager: scarlet, with black bill, wings, and tail.

Flower sticks need not be limited to bird designs. Figures of children, animals, and grotesque figures may be used to good advantage.

## PLATE THREE

## LANTERNS

Cut pattern according to the working drawing. Make many practice designs for the oblongs A, B, C, and D. Select the best design and transfer. Then cut out openings. Use animal motifs, either the head or the entire figure. Have the openings as large as possible so that the light will come through. Great care should be used in the selection of tissue papers for the lining. Yellow and orange linings are the most desirable.

Make lanterns for bungalows, porches, and for special occasions.

Another interesting problem is the round lantern of the Paul Revere type.

## PLATE FOUR

**PAD AND PENCIL CASE.** On cover paper,  $5'' \times 13\frac{1}{2}''$ , draw on short axis a center rectangle  $\frac{1}{2}''$  wide. Spread paper with paste and attach cardboards,  $4'' \times 6''$ , up to this rectangle on either side (see Fig. 1). Cut corners diagonally. Fold and paste margins.

**PENCIL HOLDER.**  $2'' \times 2\frac{1}{2}''$ . Fold short edges to the center and paste. Wrap around pencil in order to have the correct size. Paste in place on the right side of lower half of covered strawboard. (See E.)

Draw  $\frac{1}{2}''$  margins on  $4\frac{1}{2}'' \times 5\frac{1}{2}''$  paper for pad pocket. Cut corners (Fig. 2). Fold over and paste flap A. Place pocket on lower half of lining paper,  $3\frac{1}{2}'' \times 12''$ . Attach margins B, C, and D to other side of lining paper. Attach lining paper to inside of cover boards, leaving  $\frac{1}{4}''$  margins on all sides. Dry under pressure. Paste a narrow strip of paper over upper edge of pad to the perforation. Add design on cover. Slip back of pad into pocket.

## PLATE FIVE

**CLIPPING CASE.** Draw  $\frac{1}{2}''$  margins on  $8'' \times 10\frac{3}{4}''$  cover paper. Within the oblong, paste the two strawboards, leaving  $\frac{1}{4}''$  between the boards (Fig. 1). Cut corners diagonally. Paste margins.

Turn  $4\frac{1}{2}'' \times 9\frac{1}{2}''$  paper with long edge in front. Draw horizontal line  $\frac{1}{4}''$  from the top. Draw horizontal line  $\frac{1}{2}''$  from lower

edge. Draw three vertical lines  $\frac{1}{2}$ " apart on each side. Cut out upper corner rectangles,  $\frac{1}{4}$ "  $\times$   $1\frac{1}{2}$ ". Cut out lower corner rectangles,  $\frac{1}{2}$ "  $\times$   $1\frac{1}{2}$ ". Paste  $\frac{1}{4}$ " strip down to make strong edge for side pocket. Crease on vertical lines. Fold in and out. Make the other side pocket in the same way.

FIG. 3. Place pockets on lining sheet,  $6\frac{1}{2}$ "  $\times$   $9\frac{1}{4}$ ". Attach the  $\frac{1}{2}$ " top, bottom, and side margins to back of lining sheet. Attach lining sheet to inside of cover boards. (If large case is desired, enlarge space between two cover boards.) Paint manila paper a darker value of cover paper. Cut out design and mount in center of cover (Fig. 4).

## PLATE SIX

CHECKER BOARD. On book linen,  $2$ "  $\times$   $11\frac{3}{4}$ ", draw two vertical lines through the center,  $\frac{1}{4}$ " apart.

Spread paste on cardboards  $1\frac{3}{8}$ " from long edge. Attach to hinge up to  $\frac{1}{4}$ " rectangle on either side, keeping end margins of linen hinge even. Fold and paste ends of linen hinge down. Paste cover paper,  $5\frac{1}{4}$ "  $\times$   $12$ ", on strawboards, overlapping linen hinge  $\frac{1}{8}$ ". Paste sides down.

Paste book linen,  $\frac{3}{4}$ "  $\times$   $10\frac{1}{2}$ ", down the center, on the inside of strawboard, making the hinge two thicknesses of linen. Paste two papers  $5\frac{1}{4}$ "  $\times$   $10\frac{1}{2}$ ", leaving  $\frac{1}{4}$ " margins on the outer edges. Make  $1\frac{1}{4}$ " checks. Paint in a darker value of the same tone as paper.  $1$ " square checkers could be cut from basswood and painted, carrying out a color harmony.

Animals could be cut out of wood and inserted in squares for the checkers. For crowning on the king row, place a square of another color under the foundation of the cut figure.

## PLATE SEVEN

MATCH BOX. Measure and cut all materials according to diagram. Spread cover paper,  $5\frac{1}{2}$ "  $\times$   $10$ ", with paste. Place cardboard on paper, keeping top, bottom, and side margins even. Turn to right side and carefully iron out all imperfections with palm of hand. Cut corners diagonally  $\frac{1}{8}$ " from corners of cardboards. Fold over and attach margins to back of cardboard. Spread lining paper,  $3\frac{3}{4}$ "  $\times$   $8\frac{1}{4}$ ", with paste and attach to back of cardboard, keeping all margins even.

Rule  $3\frac{1}{2}$ "  $\times$   $3\frac{1}{2}$ " cardboard as illustrated. Cut out the two lower corners,  $1$ " square, scoring the lines connecting corners with

upper edge. Score with edge of sharp knife one-half way through cardboard. Fold cardboard on scored lines at right angles to center rectangle. Paste corners together with gummed tape or cloth spread with paste. (The tape dries more quickly and holds more securely.)

Spread cover and lining paper with paste, except flaps. Place cover paper on outside of box, attaching first the front, then bottom with ends pasted up on sides, then the sides. Attach lining paper.

Locate points on mount for placing of box. Cover flaps with paste and attach to mount.

Paste the two sand papers to sides of box.

**SUGGESTIONS FOR DESIGN.** The sand paper may be placed in space above match box with the border design around sand paper or around mount. Keep correct marginal spacing. Design may be executed in water colors, crayons, or stick printing.

## PLATE EIGHT

### BOXES

**FIG. 1.** Paper,  $6\frac{7}{8}'' \times 18\frac{1}{4}''$ . After constructing Fig. 1 according to diagram, make a square box, following the same plan of fastening as used in Plate Seven.

Make a collection of boxes. Notice how other boxes are constructed and fastened.

**FIG. 2. TRIANGULAR BOX.** Construct the top of box  $\frac{1}{8}''$  larger than lower part. Decorate by simple triangular design on the top. Either paint the design or cut out pattern, and attach to the top of box.

## PLATE NINE

### SEWED MAGAZINE COVER

**DIRECTIONS FOR ANY SIZE MAGAZINE.** Cut hinge of cloth the length of magazine and width of back plus  $3''$ . Fold around back of magazine, keeping margins even on either side of back. Pierce with awl through magazine and hinge in five or seven sections, according to size of magazine. Sew with linen thread.

For cover paper take the length of magazine, by four times the width, plus the width of back of magazine, plus  $\frac{3}{8}''$  for turnings. On the inside of cover paper on short axis, rule down the center a rectangle the width of back, plus  $\frac{1}{8}''$ . Rule a parallel line

the width of magazine plus  $\frac{1}{8}$ " from this rectangle on either side. Fold in ends toward back on these outer lines and fold the back on lines of rectangle. Attach inside covers to hinge, and place under pressure to dry.

If the covers are attached to under side of hinge, the cover paper must be cut a trifle shorter.

**SUGGESTIONS FOR DESIGN.** Design may be developed in a rectangle or border design, with the strongest part of the design in the corners. The name of the magazine may be printed and inclosed in a rectangle. This problem permits of the cover page of the magazine being left to view on inside.

## PLATE TEN

**TELEPHONE DIRECTORY.** Measure and cut all materials. Spread paste on cover paper,  $7\frac{3}{4}" \times 12"$ . Attach strawboard,  $7\frac{1}{4}" \times 11\frac{1}{2}"$ . Cut corners diagonally and attach margins.

Plan design on practice paper,  $7\frac{1}{4}" \times 11\frac{1}{2}"$ . This is an excellent problem for the study of good space relations. Divide into two panels and subdivide into strips. The given design has two panels,  $2\frac{1}{2}"$  wide— $1\frac{1}{4}"$  from the top,  $1\frac{1}{2}"$  from lower edge, and  $\frac{3}{4}"$  from outside edges. The strips are  $\frac{1}{4}"$  apart. Use linen tape, natural color,  $\frac{3}{8}"$  wide. Cut eight slits for the tape to slip through. Paste ends on the back. Cover heads of brass staples by circles of paper one and one-half times as large as the head. Spread paste on circle and gradually fit the circle around the head of the staple. At every inch place a staple. This forms a pocket for the strip of white or manila paper,  $\frac{3}{4}" \times 2\frac{1}{2}"$ .

Make design on  $\frac{1}{8}"$  checked paper and transfer. Paint color scheme in an analogous or complementary harmony.

# GRADE SEVEN

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## PLATE ONE

**CASE COVER FOR PAPER BOUND SCHOOL BOOKS.** Measure and cut all materials. Draw rectangle,  $\frac{1}{2}$ " wide, down center, lengthwise of outside hinge. Spread paste on cardboard  $\frac{3}{4}$ " in from long edge, and attach to hinge. Attach inside hinge to boards. Spread cover papers with paste and attach to boards, cutting corners and turning margins. Rule a line  $\frac{1}{2}$ " lengthwise on pockets. Fold, open, and spread with paste. Insert tape along fold. Attach to pocket. Place pocket on end sheet  $\frac{3}{4}$ " in from long edge, keeping head, tail, and fore edge margins of pocket even. Cut corners of pocket diagonally. Spread paste on margins and attach to back of end sheet. Repeat with other pocket and end sheet. Spread paste over back of end sheet and attach to inside of cover boards, lapping inside hinge  $\frac{1}{16}$ ". Keep head, tail, and fore edge margins all  $\frac{1}{8}$ ". Place under pressure to dry.

**SUGGESTIONS FOR DESIGN.** Print title of book in a rectangle of marginal lines, or very simple broken line design, paying special attention to good lettering. Place this on front cover correctly spaced.

## PLATE TWO

### LANTERNS

**FIG. 1.** Construct lantern according to the measurements given on diagram. Within the 5" squares make a simple structural design, letting the lines follow the outside shapes. This repetition of horizontal and vertical lines gives strength to the design. Cut out the openings and line with tissue paper. Finish at lower apex by a tassel made of twine. Add a wooden kindergarten bead.

**FIG. 2.** Same as Fig. 1, with the exception of the lower apex, which is cut off to match the upper side. To this a square with four flaps must be added for the base. Transparencies for the windows in the school room or office could be made the same as the side of the lantern.

## PLATE THREE

**KODAK BOOK.** On book linen,  $2'' \times 8\frac{3}{4}''$ , draw lines  $\frac{1}{2}''$  from each short end. Draw lines  $\frac{1}{4}''$  and  $\frac{1}{2}''$  from one long edge (Fig. 1). Paste  $5'' \times 7\frac{3}{4}''$  strawboard on  $\frac{1}{4}''$  oblong, leaving  $\frac{1}{2}''$  at each end. Paste  $1'' \times 7\frac{3}{4}''$  strawboard on large oblong. This leaves  $\frac{1}{4}''$  between boards for a hinge (Fig. 2). Cut corners diagonally and paste margins. Turn strawboard and paste cover paper,  $5\frac{3}{8}'' \times 8\frac{3}{4}''$ , leaving  $\frac{1}{2}''$  margins on three outside edges (Fig. 3). Paste book linen,  $1\frac{3}{8}'' \times 7\frac{1}{2}''$ , for inside lining of hinge, leaving  $\frac{1}{8}''$  margins. Paste lining,  $4\frac{7}{8}'' \times 7\frac{1}{2}''$ , leaving  $\frac{1}{8}''$  on the three outside edges (Fig. 4). Add three eyelets. Make the other cover in same way.

Decorate by a cut design of paper painted in complementary colors. Cut paper and punch holes for the inside leaves.

**FIG. 5. DOMESTIC SCIENCE BOOK**, used for recipes. The front cover is made with a hinge. For this cover use strawboard  $5\frac{3}{4}'' \times 7\frac{1}{4}''$ , and for the hinge, strawboard  $1\frac{1}{8}'' \times 5\frac{3}{4}''$ . The back is made of one piece of strawboard,  $5\frac{3}{4}'' \times 8\frac{5}{8}''$ . Cover strawboard with white oilcloth. Fasten book with rings.

## PLATE FOUR

**LIMP PAPER COVER BOOK.** Measure and cut all materials. Spread paste over cloth hinge and attach to back of pad, keeping top, bottom, and side margins even. Paste ends to head and tail of pad. Paste side margins to pad, folding corners carefully in at right angles and adding a little paste in fold.

Place lining paper,  $3\frac{1}{2}'' \times 5\frac{7}{8}''$ , on cover paper,  $5'' \times 7\frac{3}{8}''$ , keeping all margins even. Begin at corners and fold cover paper margins diagonally over lining paper. Fold margins. There is no pasting in this cover. Place end sheets,  $3\frac{1}{2}'' \times 5\frac{7}{8}''$ , on cover. Place cover sheets together and rule for slits and eyelets through which to insert tape. (See diagram.) After being sure that all edges are even, place ruler against marked slits and cut through cover papers and end sheets with a sharp knife. After punching eyelets in cover, place cover on either side of pad, eyelets toward back. Then punch eyelets through pad. Begin sewing with longer tape from outside of cover, going in slit 1, through end sheet, back and out through slit 2, in eyelet A, through opposite cover, up through eyelet B, through top cover, down through eyelet A, up and around head 3, down through eyelet

A, around back 4, down through eyelet A, and back through slits on opposite cover to fore edge of book.

Take shorter tape, and begin sewing in slit 5 across end sheet, out through slit 6, down through eyelet B, through opposite cover, down and around tail of book 7 up to eyelet B, down through eyelet B, around back of book 8, down through eyelet B to opposite cover, back through slits on opposite cover to fore edge of book.

**SUGGESTIONS FOR DESIGN.** Stick printing may connect the tapes on cover of book, or a horizontal rectangle may be placed with upper edge even with upper edge of tape. This border should be very simple in design and enclose the word "Notes" or simply a design filling space of rectangle executed in water colors or tempera colors.

## PLATE FIVE

### *STAB BINDING*

Cut materials according to the measurements given on diagram. Remove four outside sheets of pad for end sheets. Fold the two inside hinges down center on long axis. Spread paste on half of hinge and attach to pad. Draw line  $\frac{1}{4}$ " in from back, and with awl stab one hole in center of hinge through pad and as many more holes as are necessary. Sew with linen thread first down through center, around and up through top hole, down through center, up through bottom hole, and then join thread with knot. Draw rectangle  $\frac{5}{16}$ " wide lengthwise down center of outside hinge. Paste cardboards up to this rectangle on each side. Turn upper and lower margins of hinge and attach to inside hinge. Spread paste on cover papers and attach to board. Cut corners diagonally, turn margins, and paste. Put paste on cardboard (not on hinge). Attach hinges to inside of cardboards, keeping back edge of book even with back edge of cardboard. Attach end sheets to inside of cardboards. Two end sheets for pad are pasted to cloth hinge only on each side of pad.

**SUGGESTIONS FOR DESIGN.** Design may be applied in stick or block printing, rectangle or border design, or printed title with marginal lines. End sheets may be of lighter tone than cover paper with all-over design executed in water colors or crayon. Booklets for school use or school magazines may be bound in this manner. The case cover comes flush with the edge in this binding, but, if desired, may project  $\frac{1}{8}$ " on head, tail, and fore

edge. This is desirable on larger binding, as of magazines. In binding magazines a lining paper should be pasted to rectangle drawn on inside of outside hinge, the width of back of magazine, to stiffen hinge and keep in shape.

## PLATE SIX

**PORTFOLIO FOR 6" × 9" DRAWINGS.** Cut materials according to measurements. Rule a rectangle 1" wide down center, lengthwise of outside hinge. Rule line on cardboard  $1\frac{1}{2}$ " from back edge on short axis. Place guard paper up to this line and spread  $1\frac{1}{2}$ " wide rectangle with paste. Turn and paste up to 1" wide rectangle on hinge. Turn cardboard and iron out all imperfections of hinge with palm of hand. Turn, spread paste on top and bottom margins of hinge, and attach to inside of cardboards. Spread paste over inside hinge and attach to cover boards and outside hinge. Spread cover papers with paste and attach to cardboards, lapping hinge  $\frac{1}{16}$ ". Cut corners diagonally and attach margins. On each flap rule a line on both sides of paper  $\frac{1}{2}$ " from edge on long axis. Place guard up to this line. Spread paste and attach hinge to each flap. Spread paste over  $\frac{1}{2}$ " rectangle on flap and inside of hinge. Attach the other hinge to flap and hinge. Repeat with other two flaps. The double cloth hinge adds strength and gives workmanlike finish to project. Rule line  $\frac{1}{2}$ " from edge lengthwise on flap hinges. Place guard up to these lines. Spread with paste. Attach to end sheet, one at each side, and one at end.

Fold one edge of 8" × 8" pocket over 1" to inside. Open. Spread with paste. To strengthen edge insert tape along fold. Spread tape with paste. Attach to pocket. Place pocket over end sheet, allowing 1" margin on sides and bottom. Cut corners diagonally. Cover margins with paste and attach to back of end sheet. Dry under pressure. When both end sheets are dry, spread with paste and attach to cover boards, allowing  $\frac{1}{8}$ " margin on head, tail, and fore edge. Place under pressure to dry.

**SUGGESTIONS FOR VARIATIONS OF PROBLEM AND DESIGN.** The portfolio may be constructed without the pocket or may have pockets on each side instead of flaps on one side. This is an excellent problem for application of design which may be developed in a rectangle or border, in water colors, tempera colors, or crayon. Lettering may also be used. The word "Portfolio"

or "Drawings" may be inclosed in a rectangle with an all-over drop repeat design outside of rectangle. This should be of some simple motif in neutralized colors suitable for backgrounds.

## PLATE SEVEN

### BOXES

FIGS. 1 AND 2. SLIDING BOX OF BOGUS PAPER. Cut on heavy lines, according to Fig. 1. The box part needs no pasting. Fold sides A and B to the inside. Fold side ends C, D, E, and F to the end of the box. Fold G and H over to inside. Place an all-over pattern on the case.

FIG. 3. SMALL CARDBOARD BOX COVERED WITH LINEN. Cut a long strip four times the length of side of box, plus  $\frac{1}{4}$ " for lapping at one corner, and  $\frac{1}{2}$ " wider than the height of box. Allow  $\frac{1}{4}$ " at top and  $\frac{1}{4}$ " at bottom. Put paste on sides of box. (See drawing.) Cut notches at the corners, on upper and lower edges. Fold and paste upper margins to inside of box. Paste lower margins to base of box. Cover the bottom with linen the size of box. Line bottom of box on the inside. Cut four pieces of thin cardboard (old post cards are excellent for this purpose) to fit the sides on the inside of box. Make cardboards  $\frac{1}{8}$ " less than height of box. Cover with linen, allowing the linen to turn back on the upper and lower edges. Paste linings in place. When finished the inner pieces should form a collar, thus giving a foundation for the cover to rest upon. Cover cardboard for the top. Cut a slit in the center. Attach small loop in slit for a knob. Add lining to the top.

FIG. 4. DOUBLE BOX. Cover two small cardboard boxes of the same size. Proceed as in Fig. 3 by covering the outsides, base, and three inner linings, A, B, C, on each box. Cut a narrow strip of linen for the hinge. Attach to the two boxes on the unlined sides with paste. Cover the cardboard lids. Fold under the edges D, E, and F, leaving one long flap unpasted. Paste a narrow double strip for the knob in the center of the side E. Attach lining. Make second cover the same way. Paste the extended flap on the hinge. Add the lining to the fourth side. These boxes should be made so that the covers fit inside the boxes, and yet, when finished, are even with the upper edge of sides of box.

A great variety of attractive problems can be worked out from this model: handkerchief, jewel, powder, and veil boxes,

hair receivers, etc. Carry out entire set of boxes for bedroom. Stencil or block print the covers, or use figured chintz, silk, linen, or ribbon.

## PLATE EIGHT

### *PROJECT FOR GIRLS*

FIG. 1. LINEN BAG, 8" × 10". Make design by stick printing and dyes. (First make practice designs on squared paper.) Crease the cloth to make a straight line for a guide, while printing. Make tassels of heavy mercerized floss. The draw strings are held in place by crosses on each side. These are made by long stitches and buttonholed the entire length of the stitch.

### *PROJECTS FOR BOYS*

FIG. 2. FOBS. Collect pebbles, stones, and shells from the sea shore and the gravelled road. Bind by copper or German silver wire. Round nosed and squared nosed pliers are necessary for this work.

FIG. 3. SCARF PINS of wire, with or without sets. File end of wire sharp for pin point.

Have the students make various kinds of paper clips. Try other original problems in wire.

## PLATE NINE

BOOK PLATE BOOK COVER. Make book covers for text books, carrying out appropriate designs on the front cover and a simple book plate on the back.

Make separate book plates. After one design of book plate has been made, a stencil could be cut from which many could be reproduced. Have a book plate for each book. An opportunity for a great deal of individuality is given in this problem, for a book plate design should suggest something concerning the owner of the book—his interests, talents, vocation, etc.

## PLATE TEN

TWINE BOX. Cut materials according to measurements. Bring short edges of the 1½" × 10" cardboard or bristol board together so that they just meet, and fasten with 1½" gummed tape. Bring the short edges of the 3" × 10½" thin cardboard together so that

they just meet, and fasten them with 3" gummed tape. With narrow strips of gummed tape fasten circle of cardboard,  $3\frac{3}{8}$ " diameter, to top of  $3" \times 10\frac{1}{2}"$  collar. Cover and line  $1\frac{1}{2}"$  collar of thin cardboard with  $3\frac{1}{2}" \times 10\frac{1}{4}"$  paper, allowing  $\frac{1}{2}"$  margin at base of collar on the outside. Crease paper carefully over top edge of cardboard and attach to inside of cardboard. In using heavier paper, slit the lining paper up to top edge of cardboard. This makes it much easier to attach as well as neater in finish.

Cover  $3\frac{3}{4}"$  cardboard circle with paper  $5\frac{1}{4}"$  diameter, pasting margin to back of circle and lapping over fullness carefully. Spread  $3\frac{5}{8}"$  lining paper with paste and attach to bottom of circle, keeping  $\frac{1}{8}"$  margin even all around. Dry under pressure. Cover  $3\frac{3}{8}"$  top of box with  $4\frac{1}{4}"$  paper circle, pasting margin over to side of cover. Paste  $3\frac{1}{2}" \times 10\frac{3}{4}"$  paper to outside of box cover, turning margin up on inside of cover and pasting. Paste lining paper,  $3\frac{3}{4}"$  in diameter, to inside of top of box cover. Paste lining paper,  $3" \times 10\frac{1}{2}"$ , to inside sides of box cover. Punch hole in center of top through which to pull the end of twine.

Spread paste on outside margin of  $1\frac{1}{2}"$  collar and attach to top of base, attaching margin to inside of box. Spread paste on 3" diameter lining paper and attach to inside of bottom of box. Let dry thoroughly before placing lid on box.

**SUGGESTIONS FOR DESIGN.** A circular design to fill space on top of box and a border at bottom and top of side cover would be pleasing if applied in water or tempera colors. If a more simple treatment is desired, broken bands could be used at top and bottom of side cover and at edge of circular top. The cardboard should be of light weight so as to bend without breaking. Oak tag board or bristol board may be used as a foundation. Gummed tape is desirable for this problem, as it holds firmly and dries quickly.

## PLATE ELEVEN

**BOOK ENDS.** Round the corners of  $6" \times 8"$  bookbinders' board; cover with  $7" \times 9"$  paper, leaving even margins. Slash corners of paper so that the curved edges of the board can be covered neatly. Put under press. Score a line on board 2" from one short edge and bend covered board at right angles (Fig. 1). Add strip of gummed tape on uncovered side of board along scored line. This keeps book end in shape and also adds strength. If the class is sufficiently experienced, first score the line on

6" × 8" board, bend at right angles, attach tape along scored line, and then attach 7" × 9" cover paper, keeping board at right angles. Line with 5 $\frac{3}{4}$ " × 6 $\frac{1}{2}$ " paper.

Cover 4" × 6" board with 5" × 7" paper. Line with 3 $\frac{3}{4}$ " × 5 $\frac{3}{4}$ " paper. Paste this to base of Fig. 1, leaving 1" on each side and  $\frac{3}{8}$ " on end (Fig. 2). Paste the lining to the base. Transfer design and paint in opaque colors. Make second book end in the same way. Vary the problem by changing dimensions of book binders' boards and covering with cretonne or plain linen cloth, decorated with a stencil design.

## PLATE TWELVE

INDEX DIRECTORY. Cut strawboard, 7" × 12", the shape as given in the first diagram on Plate Twelve. Cover strawboard with 8" × 13" gray paper.

Cut lighter gray paper the given dimensions and fasten with brass staples to the covered strawboard. Cover the heads of staples with a circle of gray paper which has been spread with paste. Attach margin of circle to under side of staple, keeping top smoothly covered. Cover the upper part of strawboard with 4 $\frac{1}{2}$ " × 8" gray paper, leaving the  $\frac{1}{2}$ " margins for pasting on the sides and upper edge. The lower edge is not pasted. This covers the staples. Cut up from the lower edge two lines 1 $\frac{1}{4}$ " long, as indicated by the heavy lines. Make index tabs of gray book linen, one for each letter,  $\frac{3}{8}$ " × 2". (Notice that the first two sheets are the same size.) Paste the tab marked A on the second sheet. Add design.

## GRADE EIGHT

### PLATE ONE

FIG. 1. LAUNDRY OR CLOTHES PIN BAG. (For the clothes pin bag, cut measurements in half.) Fold material,  $16\frac{3}{4}'' \times 36''$ , in center on short axis. Sew up the side seams. Turn top in to fit a coat hanger and sew over and over. Cut opening in side toward top and bind with tape.

FIG. 2. STOCKING BAG. Stencil plain material for outside of bag. Line with a plain material, repeating one color of the design. Use embroidery hoop for rings and wrap with strip of lining material. Rings are fastened between cover and lining materials, and about two-thirds of the top of the bag plaited on them. Turn back corners to outside and tack to bag.

FIG. 3. STENCILED TABLE RUNNER. Work out border design, using monogram or initial letter for a motif.

### PLATE TWO

#### BAGS

FIG. 1. GRAY LINEN CRASH BAG,  $7\frac{1}{4}'' \times 9''$ . Work out design on  $\frac{1}{8}''$  checked paper. Embroider cross stitch border with D. M. C. floss, working on the cross stitch canvas. Hemstitch sides and ends of crash. Fasten sides by binding the seams every half inch (Fig. 1). Twist the blue and white floss for the draw strings. These are held in place by the crosses made with long stitches of white thread and covered with the buttonhole stitch. Add small blue tassels on corners.

FIG. 2. SLIPPER BAG,  $10\frac{1}{2}'' \times 14''$ . Fill in design with a running stitch. Outline each shape with a dark tone of floss. The small crosses are made by cutting narrow strips of brass and bending ends back on under side of material. Cut two shapes for the front and back of bag like drawings. On sides insert a V shape in order to make bag a little wider at the top (Fig. 3). Line with a thin silk. Add tassels and beads at corners.

FIG. 4. SHOE CASE. Make a case for right and left shoe, each case to consist of a long piece for the back and a shorter piece for the front. Bind edges with tape. Stencil monogram on the upper flap.

### PLATE THREE

#### METAL

ETCHED COPPER OR BRASS. Trunk plates, automobile monograms, fobs, suitcase and bag markers, hat markers, scarf pins, belt and slipper buckles. See Plate Seven, Grade Eight, for tools required and formulae for pickle solutions. On  $\frac{1}{8}$ " squared paper make simple designs relating to contour of the project. After a satisfactory design has been made, transfer with tracing paper. With wooden mallet, hammer out flat a piece of No. 16 gauge copper. Dip into pickle solution to remove oxide. (See Plate Seven, Grade 8.) Burnish side on which design is to be placed with a fine emery cloth. Place tracing in position on metal, insert carbon paper, and trace design. With a steel tracer mark contour of project, as otherwise this line would be lost when, later, asphaltum is burned off. Cover all parts not to be etched with asphaltum, using a round No. 2 Russian Sable brush. This requires very careful and exact work. Keep sharp clean edges. Place in etching pickle. (See Plate Seven, Grade 8.) Etch for three or four hours. Remove from solution, when etching is desired depth, and rinse in clear water. Burn off asphaltum. Immerse in cleaning pickle solution. Rinse in clear water. File edges. Rub with fine emery cloth, then crocus cloth. By placing copper over flame, brilliant coloring will be brought out. For dark parts, paint with liver of sulphur diluted with water. Paint with a clear lacquer to keep air from tarnishing metal.

### PLATE FOUR

PAPER LANTERN. Construct a Pentagon (Fig. 4) as follows: Draw a horizontal line, A-B,  $2\frac{1}{2}$ " long. Describe a circle with A-B as the radius, A as the center. Describe a circle with same radius, B as the center. At the intersection of these two circles, C, describe a circle. Draw line C-D. In order to determine length of side of pentagon, draw line F-E and continue until it cuts a circle at G. Draw A-G. Find B-H in the same way. Describe radii with G and H as centers. Draw G-I and H-I.

**To construct lantern.** Use pentagon as the base and the sides (Figs. 1 and 2). Add the flaps for pasting. Cut out openings, leaving  $\frac{1}{2}$ " margins on all sides except base at the lower half. Line with tissue paper and paste flaps together. Cut strip of paper,  $1" \times 5\frac{1}{2}"$  (Fig. 3). Fold on long axis. Cut on heavy lines. Insert as a collar in top of pentagon of the upper half.

**FIG. 5.** Make four-sided lantern. Repeat the given diagram four times. On the last side allow a  $\frac{1}{2}"$  flap for pasting.

Apply design.

## PLATE FIVE

**TIN LANTERN.** This lantern is made from a coffee can,  $4\frac{1}{4}" \times 5\frac{1}{4}"$ . Remove top. Invert can over a cylindrical mold of wood (Fig. 1). Cut wooden mold lengthwise into halves. Insert a wedge in center. In this way the mold may be removed easily. (The wooden mold can be turned out in the manual training department.) Perforate top of inverted can with small holes by means of an awl or nail filed to sharp point. Make designs for side of can; trace to can and perforate. On a thin piece of tin, draw a circle with a radius of  $3\frac{3}{4}"$ . Use  $\frac{3}{4}$  of the circle plus  $\frac{1}{2}"$  for under lapping. Perforate simple design on this circular roof. Fasten side of roof together with two brass staples, bending back the ends on under side. Cut strip of tin,  $\frac{1}{2}" \times 10"$ , for the ring on top. Make a hole at each end of strip. Place a brass staple through the holes and through apex of roof. Bend back ends. Cut four pieces of tin,  $\frac{3}{8}" \times 1\frac{1}{2}"$ . Make a hole at each end and fasten by brass staple to roof and can (Fig. 3).

Cut pattern for candle holder. Bend into a cylinder (Fig. 5). Place ends through two slits made in lid of coffee can. Bend ends back. This lid serves as base of lantern. To light candle, remove the base (Fig. 4). Cover with coat of dull black japalac.

## PLATE SIX

**TIN SCONCE.** Draw diagram with T-square and triangle to insure correct measurement. Transfer design to the tin by means of carbon paper. See that the point C swings back into a quarter circle to A. Tack tin to a board. Cut out design with a large nail, filed, to be used as a chisel. Make round or straight line openings. Cut the long line from D to the point B. On a block of wood, with wooden mallet bend at right angles on dotted

lines AA, BC, BB, BC. Next bend flaps F back so that when the whole project is folded, they will come flat against the back. As tin is very soft, do not hammer directly on it, but put a piece of paper between it and any hard surface. Bend the flaps G, which go over the wire, at right angles to the front of the scone. This can be done easily in vise. Bend back the two sides, and rivet or solder. Bend wire in vise at right angles to fit front and sides of box shape. Put the wire in next, keeping tin between the wire and the hammer. Hammer the under side of the wire. This makes a coil-like finish at top of box shape. Cut out candle holder. Make two slits in bottom of box. Stick flaps through and bend over. It would be well to drop a little solder on flaps, or rivet. File the sharp corners.

## PLATE SEVEN

*METAL DESK SET OF COPPER OR BRASS, HAMMERED OR ETCHED*

### TOOLS REQUIRED

1 wooden mallet.	1 blunt nail.
1 wooden block.	Emery cloth.
1 pair metal shears.	Crocus cloth.
1 coarse file.	Asphaltum.
1 fine file.	Lacquer.

### FORMULAE FOR PICKLING SOLUTIONS

#### *Cleaning Pickle*

10 parts water, 1 part sulphuric acid,  $\frac{1}{4}$  to  $\frac{1}{2}$  part nitric acid. *Always pour acid into water.* Mix in stone jar. Leave metal in pickle a minute or two. Use copper tongs in acid.

#### *Etching Pickle*

3 parts water, 1 part nitric acid. Etch from two to three hours.

**BLOTTER CORNERS.** Cut four rectangles of copper or brass, No. 28 gauge, 2" x 4". Flatten metal with wooden mallet. Immerse in pickle and rinse in clear water to clean metal. Make design and trace to metal. (See Plate Three, Grade 8.) If etched design is used, immerse in acid as directed in Plate Three, Grade 8. If hammered design is preferred, place on wooden block, and with hammer and blunt nail execute design. Place rectangle on wooden block, and with wooden mallet bend corners,

making right angle triangle of the rectangle as illustrated. File edges.

**INK BOTTLE BOX.** From 5" square of No. 28 gauge copper or brass, cut out corners marked X as illustrated. Dip in pickle. Rinse in clear water. Flatten metal with wooden mallet. Apply design as in Blotter Corners. File all edges. Place on block and carefully hammer into shape.

**LETTER BOX.** Cut rectangle of No. 28 gauge metal,  $5" \times 10\frac{1}{4}"$ . Clean in pickle. Flatten with mallet. Apply design. Bend into shape as illustrated over a block. File all edges.

**PAPER KNIFE.** Cut or saw a paper knife from No. 16 gauge metal,  $2" \times 8"$ . Utility as well as a pleasing contour of the knife should be considered. Immerse in pickle. Rinse in clear water. File edges carefully, making the knife bi-symmetric in shape. Apply design. Cover all parts not to be etched with asphaltum, keeping edges sharp and clean. Immerse in etching solution as directed in Plate Three, Grade 8. Clean and finish Desk Set as directed in Plate Three, Grade 8.

## PLATE EIGHT

**MAGAZINE COVER.** Cut pattern after given measurements. Decorate cover by stick or block-printing with an all-over pattern, or border design (Figs. 1 and 2). An opportunity for a variety of decorations is given.

Work out a panel design (Fig. 3), a stenciled monogram unit (Fig. 4), or paint a straight line design (Fig. 5), showing good divisions of space.

Make covers for any size or shaped book and add appropriate designs.

## PLATE NINE

**LINEN BOOK COVER.** Cut linen,  $10" \times 24"$ . Hem short edges. Fold upper and lower margins. Sew pockets as illustrated. Make design on  $\frac{1}{8}"$  squared paper from a naturalistic drawing of a gourd. Enclose design in a rectangle and place on cover, keeping correct marginal spacing. Embroider in satin stitch, using red, orange, blue, green, and blue-green.

## PLATE TEN

*BOOKLETS SEWED WITH OR WITHOUT TAPE*

**BOOKLET I—SEWED WITHOUT TAPE.** Measure and cut all materials. Draw rectangle lengthwise down center of inside of hinge,  $\frac{3}{8}$ " in width. Attach cover boards to hinge. Rule cloth for corners as illustrated in cut. Attach to corners of cover boards, allowing  $\frac{3}{4}$ " margins on sides, as ruled. Make pattern for outside cover, allowing lap of  $1/16$ " on cloth corners and hinge. When pattern is accurate, cut cover paper by it. Attach cover papers, pasting margins to inside of cardboards.

Arrange three sheets one inside the other. This makes one section. Place three sections, one on top of the other with backs together. Knock up head and back of book, letting any irregularities go to fore edge and tail of book. Mark back for sewing. Measure in  $\frac{1}{4}$ " from head and tail on back and mark for kettle stitch. Divide space between these end markings into three equal parts and mark for stitches  $\frac{1}{4}$ " in length. (See directions and illustrations for sewing in Plate Twelve, High School.) Fasten thread with bookbinder's knot, as illustrated, keeping under thread held just taut enough to admit of small loop being pulled up into knot made by upper thread. Fill back with glue. Let dry. Cut off outside sheets of booklet  $1\frac{1}{2}$ " from fore edge. Spread with paste and attach to cover boards. Spread end sheets with paste. Attach to inside of cover boards, keeping head, tail, and fore edge margins even.

**BOOKLET II—SEWED WITHOUT TAPE.** Measure and cut all materials. Draw rectangle  $\frac{3}{8}$ " wide down center of hinge. Attach cover boards to hinge. Attach cover paper to boards. Fold, paste, and attach pencil holder to right fore edge of cover board. Make sections of inside sheets. Mark, sew, and glue up back as in Booklet I. Cut outside sheets of book and attach to cover boards. Attach end sheets.

**BOOKLET III—SEWED WITH TAPE.** Measure and cut all materials. Find center of linen from short edge. Draw rectangle  $\frac{1}{2}$ " wide down center. Paste  $\frac{1}{2}" \times 3\frac{1}{2}"$  lining paper in this rectangle. Attach cardboards to linen up to line of rectangle. Cut corners diagonally and paste over margins. Make sections of inside sheets. Mark for kettle stitch on ends as in Booklets I and II. Divide intervening space from end markings into three equal parts and mark the width of tape at these divisions. Take stitch over tape each time, as in Plate Twelve, High School.

Glue up back and let dry. In gluing up the back, use only enough glue to fill the cracks thinly, and to hold the back together firmly and smoothly. Before gluing pull tapes tight across the back of book, keeping an even length on either side of back. Glue tapes to cardboard covers. Fold end sheets, spread paste on one-half, and attach to cover boards. Spread paste,  $\frac{1}{4}$ ", along fold on either side and fasten to outside page of book.

**SUGGESTIONS FOR DESIGN.** FOR BOOKLETS I AND II. An all-over drop repeat design of small motif is best for booklets. Design should be applied in crayons.

### PLATE ELEVEN

**BOX FOR BOOKLET III.** Measure and cut cardboard. Rule cardboard according to illustration, taking line inside of dash line on bottom of box,  $1/16$ ", to permit top to close over bottom of box. Score lines with knife, cutting out the  $\frac{3}{4}$ " squares marked X in illustration. Bend cardboard on scored lines. Fasten corners with gummed tape. The box is now ready for cover paper. Cut cover paper  $\frac{1}{2}$ " larger than the box all around. Cut corners carefully as illustrated. Spread paste over cover paper. Attach first the top, then back, and bottom of box, carefully ironing out all imperfections with palm of hand. Attach front, turning the  $\frac{3}{4}$ " end margins over on the sides of box. Then paste sides, turning all margins to inside of box, and pasting neatly over edge of cardboard. Cut lining paper  $\frac{1}{8}$ " less than cardboard on all sides. Spread with paste and attach first to the inside of top, then the back, then the bottom of box. Next paste front sides of the box, turning marginal ends over to sides; then attach sides. Carefully iron out all imperfections before paste dries.

**SUGGESTIONS FOR VARIATION OF PROBLEM.** Design should not be placed on box. Lining paper may be plain, of a lighter tone than the cover paper, and have a small all-over design executed in crayon or stick printing. This box may also be covered with the same linen as the booklet and lined with same paper as the sections of book. Make boxes to fit books of any size.

### PLATE TWELVE

**WRITING PORTFOLIO.** Measure and cut all materials. On outside hinge draw a rectangle 1" wide lengthwise down center. Rule line on cardboards  $1\frac{1}{2}$ " from long edge, spread paste, and attach to hinge up to line of rectangle. Turn end margins of

hinge. Paste to cardboards. Spread paste on cover papers. Attach to cover boards, cutting corners diagonally and pasting margins (Fig. 1). Cover inside hinge with paste, and attach. Fold paper and envelope pocket on lines indicated in illustration. Spread paste on inside of upper fold 1" wide, and attach to inside of pocket. Repeat with stamp pocket. Fold pencil holders as illustrated. Open, spread with paste, and refold. Paste ends together, leaving loop in center large enough to insert pencil. Paste pencil holders to inside of cover board so they project beyond back edge of cardboard the width of pencil. Spread paste on end sheets and attach left cover board, keeping head, tail, and fore edge margins even. Spread paste on inside of one-half of side margins of writing paper and envelope pocket and outside of bottom margin. Attach to lower part of left end sheet. Spread paste on margins of stamp pocket same as paper and envelope pocket. Attach to upper part of left end sheet as illustrated.

Fold calendar cover. Attach calendar to inside. Spread back of cover with paste and attach to end sheet, on line with stamp pocket as illustrated. Fold blotter ends as illustrated. Spread paste on upper third and attach to middle section of blotter end. Spread paste on end and side margins and place over top and bottom end sheet, attaching margins to back of end sheet. Spread paste over back of end sheet and attach to inside right cover board. Place under pressure to dry.

**SUGGESTIONS FOR DESIGN.** Straight line design, correctly spaced as to margins, is of most value in this problem. Execute in tempera or water colors. The inside parts of portfolio may be of paper in lighter tone than cover paper, or it may be constructed of one-tone paper throughout.

# HIGH SCHOOL

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## PLATE ONE

### *DESK SET*

**BLOTTER PAD.** Measure and cut all materials according to diagram. Spread cover paper with paste. Place cardboard on cover paper, keeping margins same on all sides. Cut corners of cover paper diagonally and attach margins to back of cardboard. Fold blotter ends. Paste the  $1\frac{3}{4}$ " side rectangle to center rectangle. Place on cardboard as illustrated. Spread paste on margins and attach to back of cardboards. Repeat with other end. Spread paste over lining paper. Attach to back of cardboard, keeping  $\frac{1}{8}$ " margin on all sides.

**WASTE PAPER BOX.** Measure and cut cardboards as directed in illustration. Cut cover papers 1" larger than cardboard around sides and top, and  $1\frac{1}{2}$ " larger at bottom. Cut lining papers  $\frac{1}{8}$ " smaller than cardboard on top and sides, and  $1\frac{1}{2}$ " larger on bottom. Spread paste on cover paper. Place cardboard on paper, keeping margins as directed. Cut two upper corners diagonally and paste two sides and top margins to back of cardboard, leaving bottom free. Cover three other cardboard sides in same manner. Cover  $7'' \times 7''$  cardboard for bottom of box. Spread paste on side lining papers. Attach to sides, keeping  $\frac{1}{8}$ " margins on sides and top. Paste bottom margins to inside of bottom of box. Spread paste on bottom lining paper and attach to bottom. Punch holes in sides as illustrated. Lace with cords and fasten them on the inside of box, so that the cord will be as inconspicuous as possible.

**SCRATCH PAD.** Measure and cut all materials. Rule rectangle  $\frac{1}{2}$ " wide, down center, on long axis of hinge. Paste cardboards to hinge up to this rectangle. Cut corners diagonally and paste over margins. Fold pencil holder and attach to lower right cardboard. Fold margins of paper pocket. Paste down top margin to pocket. Place on lower end of lining paper. Cut lower corners off diagonally. Spread paste on margins and attach to back of lining paper. Spread paste over back of lining paper and attach to inside of cover boards, creasing paper with

finger nail in against edge of cardboards, and pasting to hinge. Dry under pressure. Cardboard back of scratch pad should be slipped into paper pocket. Paste paper band over top of pad to cover commercial band.

## PLATE TWO

### *DESK SET (Continued)*

**LETTER BOX.** Measure and cut cardboard back, bottom, and front, as illustrated. Place back on  $7\frac{1}{2}'' \times 6\frac{1}{2}''$  cover paper and cut to shape of top of cardboard back, allowing  $\frac{3}{4}''$  margin on all sides. Place cardboard back on lining paper and trace around edge carefully. Then cut  $\frac{1}{8}''$  within lines at top and sides. Paste cover to cardboard back, cutting corners diagonally and pasting over all margins except bottom one. Spread paste on bottom cover paper,  $3\frac{3}{4}'' \times 7\frac{5}{8}''$ . Attach to bottom cardboard. Cut corners diagonally. Paste over margins. Spread paste on lining paper,  $6\frac{3}{8}'' \times 2\frac{1}{2}''$ , and attach to bottom. Score with sharp knife the  $2\frac{1}{4}''$  line on front cardboard and bend sides back at right angles.

Place front cardboard,  $4\frac{1}{2}'' \times 10\frac{3}{8}''$ , on cover paper,  $11\frac{7}{8}'' \times 6''$ . Cut to shape of cardboard, allowing  $\frac{3}{4}''$  margin all around. Place front cardboard on lining paper and trace around edge. Cut all around on this line except at top. Rule another line  $\frac{1}{8}''$  in from top line, and cut on this line. Spread front cover paper with paste and attach to front and sides of cardboard, keeping sides bent at right angles to front, on scored line. Cut corners diagonally and paste top margin only on front and sides. Spread paste on front and side lining paper and attach to cardboard, leaving the  $\frac{1}{8}''$  margin at top edge and keeping sides bent at right angles. Spread paste on side margins of front cardboard and attach to unlined side of back cardboard. Spread paste on lining paper for back and attach to back, inside of box. Spread paste on bottom margins of front, side, and back cardboard. Attach to top side of bottom cardboard, placing back of box flush with back edge of bottom cardboard and allowing margins on sides and front of bottom cardboard. Cut lining paper,  $5\frac{7}{8}'' \times 2\frac{1}{8}''$ , and attach to bottom of inside of box to cover the margins attached to bottom.

**INK BOTTLE BOX.** Cut materials according to given dimensions. Cut and paste cover and lining papers to the cardboards as in Letter Box. These measurements fit a regulation ink

bottle. If ink bottle should be of different size adjust measurements to bottle used.

**PEN TRAY.** Measure and cut all materials according to dimensions given. Measure and cut out V-shape corners of cardboard. Score on lines  $\frac{3}{8}$ " from all sides. Turn up sides so that corners just meet, and fasten with  $\frac{3}{8}$ " strip of gummed tape. Fold cover paper on lines indicated in illustration. Spread with paste and attach to pen tray, lapping corners and pasting margins to outside bottom of tray. Cover blotter with paste and attach to bottom of tray.

**CALENDAR MOUNT.** Measure and cut all materials according to dimensions given. Spread cover paper with paste and attach to cardboard. Cut corners diagonally and attach margins to back. Spread paste on standard cover paper and attach to standard. Cut corners and paste margins to back, except the margin at narrow end of standard, which should be left free. Attach lining to standard, leaving narrow end margin free, as in the cover paper. Make slit in lining paper. Slip in end margins and paste to inside of lining paper. Spread paste on lining paper and attach to back of mount. Cut paper the width and twice the length of calendar pad. Fold in center on short axis. Paste calendar to inside of this paper and attach to mount, keeping correct marginal spacing.

**SUGGESTIONS FOR VARIATION OF PROBLEM.** Other pieces may be added to this desk set if desired, as: Twine Box, Grade 7, Plate Ten; Book Ends, Grade 7, Plate Eleven; Index Directory, Grade 7, Plate Twelve. The application of more advanced design makes these problems valuable for High School.

### PLATE THREE

**CASE BOUND MAGAZINE COVER.** Measure and cut all materials according to dimensions given. Rule rectangle, 1" in width, on outside hinge, down center on long axis. Attach cardboards to hinge up to this line. Attach cover paper. Attach inside hinge.

Fold one long edge on pocket and spread with paste. Insert tape, and attach to pocket. Place pocket on end sheet, allowing 1" margin on head, fore edge, and tail. Cut corners diagonally. Spread paste on margins, and attach to back of end sheet. Repeat with other end sheet. Spread paste on end sheets and attach to cover boards, pockets opening toward inside hinge. Place under pressure to dry.

**SUGGESTIONS FOR DESIGN.** This design is developed from a naturalistic drawing of the moth, divided into parts and used as a corner design, correctly spaced and connected with straight marginal border lines. This measurement fits most of the popular magazines. The measurements may be adjusted to fit any magazine or paper bound book.

## PLATE FOUR

**LANTERN OF CARDBOARD.** On cardboard,  $9'' \times 23\frac{1}{2}''$ , lay off four panels,  $5\frac{3}{4}'' \times 9''$ . Make decorative landscape design. Trace design and cut out openings with a sharp knife. Place cardboard on heavy piece of glass or cardboard while cutting. Score on light lines. Line with tissue paper.

Cut out roof. Score and bend sides of roof. Paste sides together with gummed tape. Paste one-half of gummed tape,  $1'' \times 5\frac{3}{4}''$ , to upper inside edge of each panel. Set the roof in place. Paste other half of gummed tape to the inside of the roof, keeping all outside margins even. When finished, the pasting does not show from the outside. On  $7'' \times 7''$  base, draw  $\frac{5}{8}''$  margin on one side. Cut cloth hinge  $1'' \times 5\frac{3}{4}''$ . Fold on long diameter. Paste one-half of hinge to base on marginal line. Paste other half to inside lower edge of one panel of lantern. On opposite edge of base, make two small loops of wire. On corresponding panel, make two wire hooks to fasten to the base. Cut cardboard oblong, with small opening, for link by which to hang the lantern. Fasten by a fine wire. Paint the lantern black.

## PLATE FIVE

### KODAK BOOKS

**FIG. 1. BOOK CLOTH OR PAPER BOUND BOOK.** Measure and cut all materials according to diagram. Spread paste on cardboard and attach to book cloth or paper cover, keeping margins even on all sides. Cut corners diagonally. Spread paste on margins and attach to back of cardboards.

Design cover for book—keeping good space relation of tapes.

Cut slits to insert tapes in cover boards. Keep boards under pressure until dry. Fold the twelve sheets,  $8\frac{1}{2}'' \times 12''$ , on short axis down center. Place in sections of two sheets each. Place sections one on top of the other. Knock up head and back of book. Measure  $\frac{1}{2}''$  in from either end for kettle stitch. Measure in from

kettle stitch for the placing of the four tapes according to design as drawn for cover board. Fasten tapes to sewing frame as marked on back of book. Before sewing, pierce each section as marked.

**SEWING.** Begin sewing at right, and continue first in, then out, and around tape, then in, etc., as illustrated. See Plate Twelve, High School, for illustration of kettle stitch.

Place book between cover boards and insert tapes in slits. Bring the two middle tapes through first slits only, and paste to inside of cover board. Have the other two tapes come through second slits, and leave ends 4" long. These ends are decorative and should not be used for tying the book together. Spread paste on end sheets and attach to cover boards.

**FIG. 2. BLOCK-PRINTED LINEN BOUND BOOK.** Make cover boards as in Fig. 1. Measure slits for leather thongs  $\frac{5}{8}$ " in width on outside of cover,  $1\frac{1}{4}$ " from fore edge and back, and 2" from head and tail. Cut slits as measured through cover boards. Fold sheets and place in sections as in Fig. 1. Knock up head and back of book. Measure  $\frac{1}{2}$ " in from either end for kettle stitch. Measure in from either end 2". From this 2" measurement, measure the width of thong,  $\frac{5}{8}$ ". Fasten thongs on sewing frame and sew as directed in Fig. 1. Place book between cover boards and insert thongs in slits. Spread paste on end sheets and attach to cover boards. Insert snap and fastener in ends of thongs, fastening over upon front cover.

**SUGGESTIONS FOR VARIATION OF PLATE FIVE PROJECTS.** **FIG. 1.** This book may be developed in book cloth of dark blue, with blue gray paper for the inside sections, and with linen tapes dyed blue with water color. If bound in paper, design may be applied in tempera or water colors. The space relation of the tapes is a valuable problem in design and capable of many variations. **FIG. 2.** An attractive scheme for this book is linen, block-printed in black, white, and one intense color, as orange. For this combination use black for the inside sections, and black leather thongs. Fig. 2 is bound in an Austrian block-printed linen.

## PLATE SIX

**PORTFOLIO.** Measure and cut materials. Draw a rectangle,  $1\frac{1}{2}$ " in width, down center on short axis of outside hinge. Place guard 3" from short edge on one end of cardboards and spread paste. Attach to hinge up to  $1\frac{1}{2}$ " rectangle. Spread paste on cover paper. Attach to cover boards, lapping hinge  $1/16$ ", and

keeping fore edge, head, and tail margins even. Cut corners diagonally, and attach margins to inside of cover boards. Spread paste on inside hinge. Attach to inside of hinge and cover boards, creasing and pasting along two edges of cover boards and to outside hinge. Iron out all imperfections before the paste dries.

With water colors, dye linen tape the tone of cover paper. On outside of cover boards, measure slits for tape  $2\frac{1}{2}$ " from head and tail and 1" from fore edge. Cut with sharp knife through cover boards. Slip tape through and paste to inside of cover boards.

Fold pocket paper over 1" on long edge. Spread paste on 1" fold. Insert tape to strengthen edge, and attach to inside of pocket. Fold pocket as in Plate Twelve, Grade 8.

Place on end sheet, keeping head, tail, and fore edge margins even. Cut corners diagonally. Spread paste on margins and attach to back of end sheets. Spread paste on end sheet and attach to left cover board. Spread paste on the  $\frac{3}{4}$ " wide rectangle of the  $11\frac{3}{4}$ " flap. Attach  $11\frac{3}{4}$ " hinge to flap, overlapping flap  $\frac{3}{4}$ ". Spread paste quickly over  $3" \times 11\frac{3}{4}"$  hinge and attach to other side of flap and hinge, carefully ironing out all imperfections. Repeat with other side hinges and flap, and end hinges and flap. Spread paste on inside of end sheet  $\frac{3}{4}$ " back from edge on head, tail, and fore edge. Attach hinges to end sheet. Spread end sheet with paste and attach to right cover board. Dry under pressure.

**SUGGESTIONS FOR DESIGN.** Make marginal border design, using tempera or water colors. Keep correct marginal spacing. Above the center, print the word "PORTFOLIO."

## PLATE SEVEN

### COVERED BOXES

**HAT BOX.** Paste sheet wadding on the outside of the four sides and the cover of hat box.

**FIG. 1.** Cover the four sides with one long strip of chintz, allowing enough to fold over on the upper and lower edges and one end. Put paste only on the edges. Cut cardboard size of base. Line with wadding. Cover with silkoline. Paste on bottom of inside of box.

**FIG. 2.** Cut four pieces of cardboard the size of the sides. Cover and attach to inside of box. The silkoline of the sides could be plaited in, plaiting and pasting over edges at the same time.

FIG. 3. Cover the top of box with one piece of chintz. Allow enough material to turn back and cover the four inner sides. Cover cardboard for lining of top. Paste in place.

SMALL COVERED BOX. Cover candy box that has an inside collar (Fig. 1). Remove the inside collar (Fig. 2), and cover with one strip of silkoline, covering both sides and allowing  $\frac{1}{4}$ " to turn back. Place inside the box. Cover cardboard the size of base of box and paste in the bottom of box. Cut V shape from two corners A and B of cover. Paste loose end to box (Fig. 4). Strengthen hinge with strip of silkoline. Paste sheet wadding on top of cover. Cover remainder of box with one piece of chintz. Cut corners as for cover paper in Plate Ten, High School. Before pasting inside collar, turn in edges of chintz. Notice the small triangular shape (C) of the chintz which is pasted to the inner collar. Paste inner collar in place. Cover cardboard for lining of the top and paste in place.

Many variations of this problem can be made. Cover boxes with stenciled material, block-printed cloth, or wall paper.

## PLATE EIGHT

### WRITING PORTFOLIOS—LINEN BOUND

Measure and cut cardboards and outside linen cover. Rule rectangle,  $1\frac{1}{4}$ " wide, down center, on short axis of linen cover. Spread paste on cardboards and attach to linen cover up to line of rectangle. In putting paste on cardboard, work quickly, as cardboard absorbs paste rapidly. Cut corners off diagonally  $\frac{1}{8}$ " from corners of cardboard. Spread paste on margins and attach to inside of cardboard. Spread paste on lining paper hinge,  $1\frac{1}{8}" \times 8"$ , and attach to linen inside hinge,  $2\frac{1}{4}" \times 8\frac{1}{2}"$ . Turn and attach top and bottom margins to paper lining. Spread paste on inside hinge and attach to outside hinge and cover boards, pasting carefully to the edge planes and hinge between boards. Place under pressure and leave until dry. Spread paste on lining paper end sheets,  $5\frac{1}{8}" \times 8"$ , cutting corners diagonally and attaching margins to lining sheets.

Cut and line envelope and postal card pockets according to diagram. Attach top margins to inside of pocket. Place envelope pocket under postcard pocket and fold  $\frac{1}{2}$ " margins to inside of envelope pocket. Place on lower part of left end sheet, keeping the folded  $\frac{1}{2}$ " margins between pockets and end sheet, and attaching  $\frac{3}{4}$ " margins, sides and bottom, to back of end sheet.

Spread with paste and fold strap for stamp book. Make slits in center of upper half of left end sheet as illustrated. The width between slits should be 2". The length of strap on outside from slit to slit should be the width of cover of stamp book (2") plus width of back ( $\frac{1}{4}$ ") plus  $\frac{1}{8}$ ". Place end sheet under pressure and leave until dry.

Fold and paste pencil holder. Line center rectangle of strap fastener with manila paper. Spread with paste. Snip down top margin. Fold over to inside of strap. Fold and attach side margins. Place under pressure and leave until dry.

Attach strap fastener and pencil holder to center of right cover board. Attach clasp to center of strap and snap to center of fore edge of front cover board, being sure that measurements are accurate before inserting clasp. On linen writing pad pocket,  $6\frac{3}{4}" \times 8\frac{1}{2}"$ , fold and attach top margins to inside of pocket. Spread margins with paste and attach to back of right end sheet. Place under pressure and leave until dry.

**STAMP BOOK.** Paste lining paper,  $4\frac{1}{4}" \times 3"$ , on inside of linen cover. Cut corners and paste over margins to inside. Fold three sheets of waxed paper,  $2\frac{3}{4}" \times 4"$ , on short center axis. Place sheets one inside of the other to make one section. Fold stub of waxed paper,  $1" \times 2\frac{3}{4}"$ , down center on long axis and place outside of section. Open to center of section. Pierce center, and  $\frac{1}{2}"$  from each end. Sew, tying thread on inside of section. Spread stub with paste and fasten to covers. Fold colored end sheets on center short axis. Spread paste on one-half of end sheet. Attach to covers.

**PAD COVERS.** Place lining paper on linen cover,  $6" \times 9\frac{1}{2}"$ . Cut lower corners diagonally. Paste over bottom and side margins. Spread paste on blotter,  $4\frac{3}{4}" \times 7\frac{5}{8}"$ . Attach to inside of cover, leaving  $\frac{1}{8}"$  margin on bottom and sides. Place on pad, keeping bottom and sides flush with pad. Spread top margin with paste and attach to top and back of pad. Slip pad cardboard back in envelope on end sheet.

**SUGGESTIONS FOR DESIGN.** Design developed from a naturalistic drawing to fill a rectangle and embroidered in analogous or complementary color scheme on natural colored linen, makes a most attractive cover. Block printing, with water colors applied to block, is equally attractive. It is more interesting to divide this problem, having the girls embroider a design, developed from a naturalistic drawing of some flower, and the boys develop a block-print design from the same flower, the block print to be applied in marginal border.

## PLATE NINE

*LIMP LEATHER BOUND BOOK*

**DIRECTIONS FOR CONSTRUCTION OF LEATHER COVER.** The cover of the book is the width of the back, plus  $\frac{1}{8}$ " on either side, plus the width of each side of the book. The length of the cover is the length of the book. A margin of  $\frac{3}{4}$ " must be allowed on all sides for pasting to the inside of cover. Rule a rectangle  $\frac{5}{8}$ " wide down center. Rule a second line  $\frac{1}{8}$ " from rectangle and parallel to it. From this line and parallel to it, draw a third line the width of book from this on either side. This leaves the  $\frac{3}{4}$ " margin on sides. Draw line the width of cover  $\frac{3}{4}$ " down from upper edge. Take the measurement of length of book and draw a line parallel to this line. This gives diagram of book cover, back, sides, and margins.

Cut lining paper the width and length of large rectangle. Do not paste lining paper to cover, but paste margins of cover over on lining paper. Spread paste on back of book and attach to cover. The leather must be the thinnest of skiver to do this without skiving on lines at edge of lining paper and on all sides where cover turns; also on corners. If leather is of medium weight skiver, it must be slightly skived wherever it turns an edge, and at corners if rounded. Corners may be rounded or squared. If squared, cut diagonally and paste over as in previous problems.

**BLANK BOOKS SEWED ON TAPES** (See Plate Twelve). Paste tapes of book to outside sheets of book. Cut sheets off to  $1\frac{1}{2}$ " in width. Paste back of book to leather, and  $1\frac{1}{2}$ " stubs to lining sheets. Fold end sheets in center on short axis. Spread paste on one-half and attach to cover, keeping  $\frac{1}{8}$ " margin on head, tail, and fore edge. Spread paste  $\frac{1}{2}$ " on other half of end sheet, the length of end sheet, and attach to book. Dry under light pressure.

The artistic series of paper bound Keppel booklets are most attractive bound in the limp leather.

## PLATE TEN

**HANDKERCHIEF BOX.** Measure and cut all materials. Cut out corners on bottom and top of box. Score lines with sharp knife and bend over at right angles. Fasten sides of bottom and top of box together with gummed tape. Fold cover papers as illustrated. Spread paste on inside of bottom cover papers. Attach to bottom of box, carefully ironing out all wrinkles and air bub-

bles. Paste long sides of box, attaching margins at end to short sides of box. Attach short sides of box. Paste margins over edge of box to inside of box. Attach cover paper to top of box in same manner. Attach lining papers to top and bottom of box. Crease carefully into edges and corners, pasting smoothly to top and bottom, then sides. Score the cardboard collar, bend at right angles, and place inside of bottom of box. See that it fits exactly. Remove from box and attach cover papers to both sides and top edge of collar, keeping corners turned at right angles. It is easier to fasten the collar together at the loose corner with gummed tape before covering. Spread paste on inside of sides of bottom part of box. Slip collar in and attach to sides. Allow it to dry before placing top on bottom of box.

**SUGGESTIONS FOR VARIATION OF PROBLEM.** This box should be covered with a toned paper and may or may not have design applied. It should be lined with a paper lighter in tone and more intense. This box may be made in any shape, a long narrow box for neckties or gloves, a square box for veils or large handkerchiefs, a small box for jewelry, etc. Partitions may be inserted by fastening to collar with gummed tape before covering.

## PLATE ELEVEN

**RECIPE BOX.** Cut cardboard as illustrated. The dash lines, along the edge of box, indicate that the box is cut  $\frac{1}{8}$ " inside these lines to admit of the lid fitting the box. Score on light lines on outside of box except side drop II, which is scored on inside of box. Bend box into shape. With  $3\frac{3}{4}$ " gummed tape fasten edges of side I and end I together. With  $3\frac{3}{4}$ " gummed tape fasten edges of side I and end II together. With  $2\frac{1}{2}$ " gummed tape fasten edges of side II and end I together. With  $2\frac{1}{2}$ " gummed tape fasten edges of side II and end II together, leaving side drop II free. Reinforce with 5" tape along scored line of side drop II and side II. With  $1\frac{1}{4}$ " gummed tape fasten together edges of side drop I and end drop I. With  $1\frac{1}{4}$ " gummed tape fasten together edges of side drop I and end drop II.

Cut cover paper as illustrated, folding on lines as marked. It is wise to cut pattern of practice paper, as the thickness of cardboard and paper varies. Spread paste over inside of cover paper, top, drops, and side I. Attach top to top of box, ironing out all imperfections while pasting. Next attach side I, then side drop I, end drops I and II, turning margins and attaching margins

of side I to ends I and II, and attaching other margins to inside of box. Spread paste on side II and side drop II. Attach bottom, then side II, and then drop II, pasting paper in carefully along line where side drops, and keeping side drop II in upright position while attaching cover paper. Paste margins of side II to ends I and II and other margins to inside of box. Spread paste on ends I and II. Attach to ends of box and margins to inside of box.

Cut lining papers. Fold on lines as illustrated. Spread with paste and attach to box, beginning with top, then side and end drops, then side I, bottom, and side II, pasting margins of sides I and II and bottom to ends I and II. Spread paste on end lining papers and attach to ends.

Index cards may be purchased or made, according to the amount of time to be spent on this problem. They are  $3\frac{1}{2}$ " by  $4\frac{1}{2}$ ", with index margins on top  $\frac{1}{4}$ " wide. Place index at the left side of one-third of the number of cards; in center of one-third the number; and on the right side of one-third the number. In index space print the title of the recipes as soups, meats, vegetables, salads, etc. Recipes are to be written on cards,  $3\frac{1}{2}$ "  $\times$   $4\frac{1}{2}$ ", and inserted back of the index card to which they belong.

**SUGGESTIONS FOR DESIGN.** For utility this problem should be executed in dark cover paper. The lining may be of more intense color and the cards of cream oak tag board. Design may or may not be applied to top of box. If applied, adhere to very simple structural design and execute in tempera colors.

This index box may be used for many purposes: bills, class notes; as textiles, biology, chemistry, etc.

## PLATE TWELVE

### BOOKBINDING

**ONE-HALF CLOTH BOUND BOOK.** Measure and cut all materials. Fold all sheets down center on short axis and all stubs down center on long axis. Place a stub outside of each sheet and fasten with a little glue at top and bottom. Place a stub on all but two sheets. Insert one sheet and stub within another sheet and stub, making a section of two sheets and two stubs on all but the first and last sections which have no outside paper stub.

Rule the two inside cloth hinges ( $1" \times 11\frac{3}{4}"$ )  $\frac{1}{4}"$  from one side on long axis. Fold on this line, the right side of cloth, to inside of hinge. On outside sheet of end sections rule a line lengthwise  $\frac{1}{4}"$

from fold. Spread paste on this  $\frac{1}{4}$ " rectangle and attach inside of  $\frac{1}{4}$ " rectangle of hinge. Place sections on top of each other, keeping sections with cloth hinges on top and bottom. Knock up head and back.

**SEWING.** Divide book into four equal sections, beginning  $\frac{1}{2}$ " from either end. Cut v-shaped notches on marks  $\frac{1}{2}$ " from either end, on all sections except the first and last. On the three inner markings, set off width of tape with pencil. Knock up head and back of book. Place book on table, back of sewing frame, head to right, and fore edge toward bookmaker. Cut three tapes 5" long and place on sewing frame with thumb tacks, according to measurements on back of book. (See illustration.) Reverse first section of book on sewing frame, back of section now toward bookmaker. Place left hand around sewing frame and between center leaves of section; with needle in right hand pierce a section according to marks on either side of tapes and  $\frac{1}{2}$ " end kettle stitches. With threaded needle in right hand begin to sew from right end through to middle of section, allowing an end for tying later. With left hand take the needle and put out through the next hole. With needle in right hand take thread over tape and through next hole to inside of section. With left hand return needle through next hole out. With right hand take needle around tape into next hole, and so on to end of section at the left.

Reverse the second section to sewing frame. Pierce pencil markings. Start to sew from left and proceed as in section one. Draw thread tightly, always pulling in the direction to which one is sewing, otherwise the paper will be torn. When finishing the second section, tie the two sections together at right end kettle stitch, with bookbinders' knot, as illustrated in Plate Ten, Grade 8. Reverse the third section to sewing frame. Pierce section as marked. Sew through first two holes. With needle take up thread of other two sections over tape in kettle stitch as illustrated, and proceed with sewing, kettle stitching every three sections together over tapes. Proceed to end of section three and kettle stitch end of section to preceding section two. Kettle stitch each section to preceding section each time at markings  $\frac{1}{2}$ " from either end in order to hold sections together. Continue sewing of sections, kettle stitching together at ends each time, and kettle stitching over tapes in sections of three. Fasten at end with bookbinders' knot. Trim thread, allowing an end of  $\frac{1}{2}$ ". Apply a good coat of glue to fill the back of book. Use only enough glue to fill back evenly and thinly. Dry under pressure.

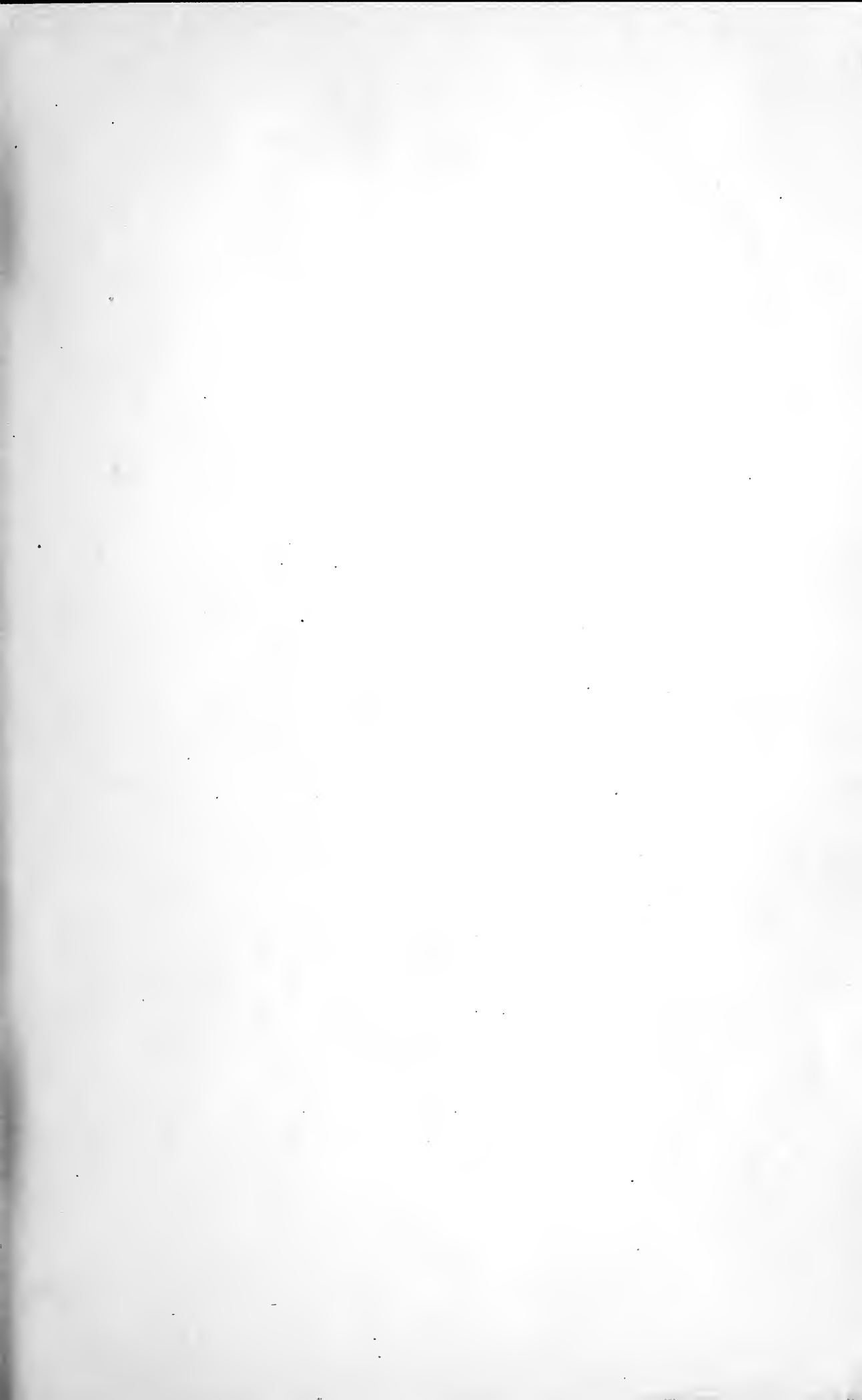
**PLAN FOR COVER OF BOOK.** On hinge rule rectangle the width of back of book and length of cover boards,  $\frac{3}{4}$ " by 12".  $\frac{1}{4}$ " from the 12" lines, rule lines parallel to these lines. Place guard  $1\frac{1}{4}$ " from long edge of cover board and spread paste on this rectangle. Attach cover to hinge up to line  $\frac{1}{4}$ " from rectangle. Repeat with second cover. Paste a rectangle of manila paper,  $\frac{3}{4}$ " by 12", to rectangle drawn on hinge. Spread paste on margins of hinge and attach to insides of cover boards. Cut corners as in Plate Ten, Grade 8, according to measurements. Attach to corners as illustrated. Cut pattern for cover paper, lapping cloth corners and hinge  $1/16$ ". When accurate, cut cover paper by pattern. Spread with paste and attach to cover boards, turning margins and attaching to inside of cover boards. Glue tapes to inside hinges on book and cut off at edge of hinge. Spread  $\frac{3}{4}$ " side of hinge with glue and attach to cover boards, keeping back of book against rectangle of outside hinge. Spread paste on end sheets and attach to inside of cover boards, keeping margins even. This makes an excellent scrap book and may be used by the class to mount designs.

**SUGGESTIONS FOR DESIGN.** Make an all-over drop repeat on outside covers, using a small motif developed from a naturalistic drawing or a geometric design. Execute in water colors or tempera colors.

**ONE-HALF LEATHER BOUND BOOK.** Measure and cut all materials. Sew as in previous problem. Draw rectangle on leather hinge. Draw line  $\frac{1}{4}$ " from rectangle to which cover boards are pasted and a line across top and bottom of hinge to which edges of cover boards come. Draw lines on leather corners, as illustrated in Plate Ten, Grade 8. Place leather with right side against smooth stone or heavy glass surface, and with skiving knife very carefully skive or scrape thin pieces of leather on lines drawn on leather and all edges of leather. This is for turning edges neatly, that in pasting leather to cover boards there may be no visible bulge where leather ends and paper or cloth cover begins. After skiving leather thin enough to turn easily, attach cover boards to hinge and corners to cover boards, as in half-cloth bound books. Cut cover paper or cover cloth after making pattern, as in previous problem. Glue book to cover boards and insert end sheets, as in previous problem.

**SUGGESTIONS FOR VARIATION OF PROBLEM.** Rebind old books. Remove cover boards. If super is torn, take off and replace with new super. Clean edge of book with sand paper. Replace old head bands with new. Cover back with lining paper,

letting paper come to extreme upper and lower edges of head bands. Attach super and lining paper to book with glue. Make new cover, half-cloth bound or half-leather bound, as desired. Paste book to cover boards. Fold end sheets. Paste one-half to cover boards and  $\frac{1}{2}$ " from back on outside sheets of book. If the back of the book is in bad condition it should be taken apart carefully, section by section, and resewed on tapes. Magazines may be bound in this way, but must always be resewed on tapes. School magazines for the Library or Art Department are made durable by binding in this manner.







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